EAC 8

Miscellaneous Pelagic Cruise No.8

SUMMARY OF EASTERN PACIFIC OCEAN BIRD OBSERVATIONS

24 January - 6 March 1967
Aboard the R/V Argo

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During the period 24 January - 6 March 1967 the R/V ARGO was engaged in oceanographic research in the Eastern Pacific Ocean as part of the EASTROPAC Project which is an attempt to develop the pelagic tuna resources through a thorough knowledge of the environmental features of the region. The ship departed San Diego heading south for 20°N-119°W. Then it sailed south to 20°S-119°W where it turned east to 126°W and then north again to 20°N-126°W. From there it returned to San Diego. The major area of interest was between 20°N and 20°S. In this region environmental data were collected at approximately 20 mile intervals. As part of this program bird and mammal observations were made by me for a total of 42 days. This preliminary report summarizes these observations.

A total of 429.08 diurnal hours was spent observing while the ship traveled 3,354 miles. An additional 15.25 hours of observations were made at night while the ship was stopped on stations.

During the daylight hours a total of 3,917 birds of 38 species was seen. Fourteen birds of 4 species were seen at night. Sooty Terns (2,313) and Leach's Storm Petrels (749) were the dominant birds in the whole area. Only one other species (Wedge-tailed Shearwater) was seen in numbers greater than 100.

Tables 1-11 summarize all the observations made and Figures 1-19 show the distribution of several of the species. Further information is provided in the Species Account section. This report is only a preliminary report and will be modified after the environmental data are analyzed.

Methods

Watches were maintained for an average of 10.22 hours per day between sunrise and sunset. All observations were made from the flying bridge, which offered the best view of the surrounding ocean. The ship was a very steady platform, rolling very little or not at all. Only when the ship was headed into a strong wind was there any trouble looking forward. Unfortunately a lab on the flying bridge blocked the view aft, so it is very likely that some birds were missed in this direction.

Discussion

For the purpose of analysis, the area has been divided into seven sections as follows: A) San Diego to 20°N 119°W; B) 20°N 119°W to 0°N 119°W; C) 0°S 119°W to 20°S 119°W; D) 20°S 119°W to 20°S 126°W; E) 20°S 126°W to 0°S 126°W; F) 0°N 126°W to 20°N 126°W; and G) 20°N 126°W to San Diego. These areas are purely arbitrary, but for the present allow for comparison between various parts of the cruise tract. In the future when the environmental data are available, a more meaningful analysis will be possible by dividing the region into the various water masses and current regions. Tables 2-10 summarize the observations made in each of these seven regions.

Area A was characterized mainly by the presence of Leach's Storm Petrels and Black-footed Albatross with an occasional Manx Shearwater. Many coastal California birds were seen only on the first day. When the ship passed through the same general area in March, Leach's Storm Petrels were still common but Black-footed Albatross were almost absent. Also

Cook's Petrels were seen in small numbers.

Sooty Terns became the dominant bird in area B with Leach's Storm Petrel still common and a scattering of shearwaters and petrels. The greatest number of birds were seen near 10°N. On the return trip along 126°W, the species composition did not change much, but large numbers of birds were seen from 3°-10°N instead of being concentrated in one small area.

Areas C and E were similar in species composition with the Sooty Tern still the dominant species and Leach's Storm Petrel decreasing. Shearwaters and petrels were almost absent from these areas. On each leg there were concentrations of birds between 10°S and 15°S. A secondary concentration was found at 7°S on the eastern leg, and at 3°S on the western leg.

Area D had only a few terns and shearwater-petrels.

The abundance of birds this trip does not appear to correlate very well with the current system in the region. The Equatorial Countercurrent was found between 2°N and 6°N this trip. On the eastern leg birds were most abundant north of the Equatorial Countercurrent with very few birds at the edges or in it. While on the western leg they were common north of it, south of it, and in it. The secondary concentrations of birds in the Southern Hemisphere were not related to any special feature of the ocean currents, with all of them lying in the South Equatorial Current. There was one interesting relationship with the Countercurrent. If we plot the number of shearwater-petrels seen per day (figure 3) and then delineate the area of greatest abundance (i.e., more than ten birds per day) it cam be seen that the southern boundary of this area is also the southern boundary of the Countercurrent. This relationship is even more

evident in some of the individual species,i.e., Tahiti Petrel and Juan Fernandez Petrel. Why this relationship should exist cannot be determined at present.

The best correlation between birds and the pelagic environment seems to be a negative one - where there is a scarcity of food and nutrients in the water there are few birds. Such an area was found this trip between 15°S and 20°S, where only an average of 11.3 birds per day were seen.

Probable Land Bases of Species Seen in the Study Area

The following table is an attempt to show the origin of the birds in the study area. For most of the species this is highly speculative but in some cases (e.g., Black-footed Albatross) it is definite because these areas are the only places where the species nest.

Species Seen Only off California (North American)

Arctic Loon
Brown Pelican
Cormorant (sp.)
Surf Scoter
Western Gull
Cassin's Auklet
Ring-billed Gull
Heermann's Gull
Black-legged Kittiwake
Royal Tern

North and Central American Coast

Wedge-tailed Shearwater(dark phase)+
Manx Shearwater +
Leach's Storm Petrel +
Red-billed Tropicbird
Red-footed Booby +
Red-Phalarope +
Blue-faced Booby +
Pomarine Jaeger +
Long-tailed Jaeger +
Herring Gull
California Gull
Sooty Tern +

Hawaiian Islands including Leewards

Black-footed Albatross +
Laysan Albatross
Wedge-tailed Shearwater (light phase) +
Red-tailed Tropicbird +

New Zealand

Cook's Petrel +

Juan Fernandez Islands

Juan Fernandez Petrel +
Kermadec Petrel +
White-winged Petrel +

French Polynesia and Pitcairn Islands

Tahiti Petrel +
Phoenix Petrel +
Kermadec Petrel +
Murphy's Petrel +
Herald Petrel +
White-throated Storm Petrel +
Red-tailed Tropicbird+
White-tailed Tropicbird +
Blue-faced Booby +
Red-footed Booby +
Great Frigatebird +
Sooty Tern +
Fairy Tern +

Line Islands

Sooty Tern ?+

+ seen between 20°N and 20°S

SPECIES ACCOUNTS

Black-footed Albatross (Diomedea nigripes)

Small numbers of this species followed the ship from 25-29 January, again on 6 March. In January they were found as far south as 18°36'N, but in March they were not seen until 31°15'N.

Since all the individuals lacked white rumps and many of the ones seen closely were molting from a brownish plumage into the slate-colored one of adults, it is likely that all of them were first year birds.

Laysan Albatross (Diomedea immutabilis)

One Laysan Albatross was seen on 5 March at 28°52'N-119°27'W.

Wedge-tailed Shearwater (Puffinus pacificus)

All Wedge-tailed Shearwaters were seen north of the equator (see

figure 9). The color phase ratios for the various days are quite interesting. Basically there was a light phase population north of 7°N extending to 14°N. South of 5°N there were mainly dark phase birds. The nearest island where the species nests is San Benedicto, over 700 miles away off the coast of Mexico. However, dark phase birds outnumber light phase birds two to one on this island. Therefore, we can conclude that the birds seen between 7°N-14°N were not from San Benedicto, for if they were, we would have expected a much higher proportion of dark phase birds.

The only light phase populations close to this area are present on Johnston Atoll and the Hawaiian Islands. It therefore seems likely that the individuals seen between 7° and 14°N are from these island groups. Since only a small number of individuals were seen, it seem unlikely that this is the main wintering area for the population. Possibly it is further east and south. Data collected on the JORDAN and ROCKAWAY will either prove or disprove this idea.

Sooty Shearwater (Puffinus griseus)

One individual of this species was seen on 5 March as it headed north.

Manx Shearwater (Puffinus puffinus)

The subspecific identity of this species was not determined, but it is most likely auricularis of the Mexican coast. One individual was seen as far south as 6°50'N, although most of them were seen north of 14°N.

Juan Fernandez Petrel (Pterodroma externa externa)

Juan Fernandez Petrels were seen in small numbers north of the

Countercurrent. One bird was seen outside of this area at 12°18'S - 126°W. All those individuals seen closely were referable to this race.

Tahiti Petrel (Pterodroma rostrata)
Phoenix Petrel (Pterodroma alba)

Separation of these two species in the field is still rather difficult. The best character at close range is the white line on the underwing of the Phoenix Petrel but this is very hard to see. To me the Tahiti Petrel is larger, and browner with longer, broader wings. I am positive that I saw Tahiti Petrels, but not so sure about the Phoenix Petrel.

This group was found mainly in the region of the Countercurrent.

Kermadec Petrel (Pterodroma neglecta)

Eight Kermadec Petrels (3 intermediate phase, 2 dark phase, and 3 light phase) were seen north of the South Equatorial Current. This species was not restricted to the Countercurrent region as many of the other shearwater-petrels were.

Herald Petrel (Pterodroma arminjoniana heraldica)

Four Herald Petrels were seen south of 10°12'S, undoubtedly from the breeding colonies in the Pitcairn Islands or French Polynesia.

At close range there is no trouble telling this species from the preceding one. A white line extends through the center of the Herald Petrel's underwing, which is not present in the Kermadec Petrel. The effect of this line is to give the Herald Petrel the appearance of a white underwing while the Kermadec only appears to have a white patch towards the end of the wing. This species also appears to be smaller than the Kermadec Petrel.

Murphy's Petrel (Pterodroma ultima)

Three birds believed to be this species were seen on 16 February less than 300 miles from the nearest nesting colony.

The following was recorded in the log sheet " all dark-medium size - high arching - straight directional flight - no white seen in wings - lighting not good."

Cook's Petrel (Pterodroma cookii)

One Cook's Petrel was seen on 8 February at 3°09'S-119°04'W. Six more were seen on 4 March and another one on 5 March less than 600 miles off the coast of Baja California. Judging from previous specimen records in this area, these birds belong to the New Zealand population, although it is quite possible that they are in fact members of the South American race.

White-winged Petrel (Pterodroma leucoptera)

One White-winged Petrel on 11 February at 10°41'S-119°W. This "species" is easily separated from Cook's Petrel by the dark head (especially the side of the head) which is not concolored with the back.

Leach's Storm Petrel (Oceanodroma leucorhoa)

Leach's Storm Petrels were the second most abundant species in the study area. They were seen on 34 of the 42 days of observation and occurred as far south as 13°42'S.

All the black, white-rumped storm petrels that were seen closely were this species. Generally, the black line through the white rumps was used to make this positive identification.

White-throated Storm Petrel (Nesofregatta albigularis)

Eight White-throated Storm Petrels were seen between 5°52'S and

14°08'S along both the 126°W and 119°W meridians. This places them roughly 600+ miles east of the Marquesas where they nest.

One of the most interesting aspects of this species' behavior at sea is its habit of "kicking off" of the water. A bird will fly along, low to the water, and then vigorously kick off a wave, causing the bird to fly parallel along the wave, similar to surfing. This action probably allows the bird to see small animals that are being carried along by the crest of the wave and then to feed on them. Not all of the storm petrels kicked off vigorously. At times they would only travel a few inches sidewards.

Red-billed Tropicbird (Phaethon athereus)

One individual of this species was seen on 27 January at 21°04'N-118°54'W. Evidently they do not range far from the American coast.

Red-tailed Tropicbird (Phaethon rubricauda)

The distribution of this species (see figure 14) is very interesting. It appears to me that there were two distinct populations in the area - a northern and southern one with a hiatus of some 420 miles between them. Since Red-tailed Tropicbirds are not known to nest east of this area, the birds must have come from areas to the west. I suspect that the southern population came from French Polynesia and the northern one from the Hawaiian Islands. Twenty-nine birds were seen in the northern area of about 1,200 linear miles. In the Cromwell Grid, which was near Hawaii and twice as long, only two months out of 15 had higher totals, indicating that this Eastern Pacific Area had a higher density than the Central Pacific. Four out of the 29 birds, (13.8%) were positively first year birds. Four out of 16 (25%) birds in the southern area were also in this age class. It is very likely that most, if not all, of these birds

were less than three years old but recent research (Woodward, MS) has indicated that after 15 months, it is impossible to separate the age classes in the field.

Confusion of this species with the previous species in the field is unlikely. In all plumages the Red-billed Tropicbird has extensive areas of black in the outer primaries, which the Red-tailed Tropicbird does not have.

White-tailed Tropicbird (Phaethon lepturus)

Four White-tailed Tropicbirds were seen south of 10°S.

Blue-faced Booby (Sula dactylatra)

Five individuals of this species were seen, all of which were immatures molting into the first subadult plumage. Sixty percent of the birds were seen at 15°N-119°W.

Red-footed Booby (Sula sula)

Only two Red-footed Boobies were seen - one at 9°38'N and the other at 5°40'S-118°56'W.

Frigatebird (sp.) (Fregata)

Only one frigatebird was definitely identified to species - a Great Frigatebird. It is very likely that all frigates were referable to this species. All but one of the individuals were seen south of the equator. The greatest number (see figure 15) of birds was seen at the closest point to the Marquesas, where these birds probably are from.

Red Phalarope (Phalaropus fulicarius)

About 33% of the identified phalaropes were of this species, although it is very likely that Northern Phalaropes also occurred.

Very few of the birds appeared to be migrating, indicating that this area is a part of the wintering range of this species (see figure 16).

Pomarine Jaeger (Stercorarius pomarinus)
Long-tailed Jaeger (Ster corarius longicaudus)

These two species of jaegers were identified, but I do not feel at all confident in separating the three jaegers in the field and it is very likely that the Parasitic Jaeger also occurred in this area and went unnoticed or misidentified.

Jaegers were scattered over the whole area, which is evidently a wintering area for the group (see figure 17).

Sooty Tern (Sterna fuscata)

Sooty Terns were by far the most abundant bird in the study area, accounting for 59.05% of the total population. They were found mainly between 15°N and 15°S (see figure 18). The distribution along the 119th meridian was very different from the distribution along the 126th meridian. On the eastern leg abundance was bimodal with a peak at 10°N and 7-15°S. However, along the western leg they were abundant from about 13°S to 7°N with a small gap along the equator.

The origin of these birds remains obscure but there are a few relevant points. First of all, immature or subadult birds were seen throughout the area indicating that the birds in the area were post-nesters from the fall nesting season. Secondly, out of fourteen traveling flocks, (north and south of the equator) 13 were headed east, while the other one was headed west. And finally, 27 of 28 frigatebirds were found south of the equator associated with the Sooty Tern flocks.

The fact that the flocks were headed east would indicate that the birds were from the west i.e., Marquesas and Line Islands. These island groups also have a fall breeding cycle which would account for

the immature birds in the flocks. The frigates in the southern areas could be from the Marquesas (or Tuamotus) which was the nearest land. Perhaps the birds north of the equator were from the Line Islands and consequently had no frigates associated with them. The islands off the American coast that have Sooty Terns are another possible source of these birds, but they have a spring breeding cycle which would not account for the immatures in the flocks, especially since the direction of flight would indicate that they would be returning to the islands to nest. All of this is of course, pure conjecture and must await further work in the area before any definite statements can be made.

Fairy Tern (Gygis alba)

Fairy Terns were found in fair numbers south of the equator and only occasionally north of it (see figure 19). The data from this grip indicate that this species wanders great distances from land, as one was seen well over 1,000 miles from the nearest land, and they were common at the 600 mile mark.

Cetaceans

Figure 4 shows the numbers of mammals seen per day during the trip. They were most common near the equator and in the California Current, but were almost totally absent in the Southern Hemisphere.

TABLE 1. SUMMARY OF DAILY OBSERVATIONS

	AREA A	B	C	D	E	F	G	Total
No. Miles	381	576	588	203	641	611	354	3,354
No. Hours	33.30	100.17	88.65	22.87	77.50	77.17	29.42	429.08
No. Birds	343	1086	584	19	994	788	103	3,917
No. Flocks	9	18	14	.0	22	25	1	89
Ave. No. Birds/Flocks	13.8	31.8	35.2	0	39.7	22.6	10	-
Ave. No. Birds/Hour	10.3	10.89	6.59	.83	12.83	10.21	3.5	-

ABUNDANCE OF SPECIES GROUPS by AREA

Species Group	AREA A	B	C	D	E	F	G	TOTAL	% of Total Population
Loon	1	0	0	0	0	0	0	1	<.1
Albatross	14	3	0	0	0	0	3	20	.5
Shearwater-Petrel	14	187	10	7	8	105	13	344	8.7
Storm Petrel	152	366	31	0	43	178	42	812	20.7
Tropicbird	1	21	15	1	6	9	0	53	1.3
Pelican	28	0	0	0	0	0	1	29	.7
Booby	0	4	1	0	1	1	0	7	.1
Cormorant	9	0	0	0	0	0	0	9	.2
Frigatebird	0	1	5	0	22	0	0	28	.7
Duck	57	0	0	0	0	0	0	57	1.4
Shorebird	6	2	8	1	16	5	16	54	1.3
Jaeger	2	6	4	0	3	7	0	22	.6
Gull	53	0	0	0	0	0	28	81	2.0
Tern	1	494	505	10	886	481	0	2377	60.6
Alcid	3	0	0	0	0	0	0	3	<.1
Miscellaneous	2	2	5	0	9	2	0	20	.5
TOTAL	343	1086	584	19	994	788	103	3917	

TABLE 2. SPECIES TOTALS By

Species or Species Group	AREA A	B	C	D	E	F	G	TOTAL
Arctic Loon	1	0	0	0	0	0	0	1
Black-footed Albatross	14	3	0	0	0	0	2	19
Laysan Albatross	0	0	0	0	0	0	1	1
Wedge-tailed Shearwater	0	84	0	0	0	18	0	102
Sooty Shearwater	0	0	0	0	0	0	1	1
Manx Shearwater	5	9	0	0	0	0	2	16
Juan Fernandez Petrel	0	30	0	0	0	38	0	68
Pterodroma externa	0	25	0	0	1	12	0	38
Tahiti Petrel	0	3	0	0	0	6	0	9
Kermadec Petrel	0	2	0	0	0	6	0	8
Murphy's Petrel	0	0	0	3	0	0	0	3
Herald Petrel	0	0	1	1	2	0	0	4
Phoenix Petrel	0	1	0	0	0	1	0	2
Phoenix or Tahiti Petrel	0	1	0	0	0	0	0	1
Cook's Petrel	0	0	1	0	0	0	7	8
White-winged Petrel	0	0	1	0	0	0	0	1
Pterodroma	1	4	2	2	2	1	1	13
Shearwater-Petrel	8	28	6	1	3	23	2	71
Leach's Storm Petrel	16	57	6	0	15	40	2	136
Leach's type	111	283	20	0	21	138	40	613
White-throated Storm Petrel	0	0	4	0	4	0	0	8
Storm Petrel sp.	25	26	1	0	3	0	0	55
Red-billed Tropicbird	1	0	0	0	0	0	0	1
Red-tailed Tropicbird	0	20	11	1	4	9	0	45
White-tailed Tropicbird	0	0	2	0	2	0	0	4
Tropicbird sp.	0	1	2	0	0	0	0	3
Blue-faced Booby	0	3	0	0	1	1	0	5
Red-footed Booby	0	1	1	0	0	0	0	2
Great Frigatebird	0	0	0	0	1	0	0	1
Frigatebird sp.	0	1	5	0	21	0	0	27
Brown Pelican	28	0	0	0	0	0	1	29
Cormorant sp.	9	0	0	0	0	0	0	9
Surf Scoter	57	0	0	0	0	0	0	57
Red Phalarope	0	0	0	0	4	3	10	17
Phalarope sp.	6	2	6	1	12	2	6	35
Shorebird sp.	0	0	2	0	0	0	0	2
Pomarine Jaeger	0	1	2	0	0	6	0	9
Long-tailed Jaeger	0	0	0	0	3	1	0	4
Jaeger sp.	2	5	2	0	0	0	0	9
Western Gull	4	0	0	0	0	0	10	14
Herring Gull	4	0	0	0	0	0	13	17
California Gull	2	0	0	0	0	0	3	5
Ringbilled Gull	1	0	0	0	0	0	1	2
Heermann's Gull	6	0	0	0	0	0	0	6
Black-legged Kittiwake	1	0	0	0	0	0	1	2
Larus sp.	35	0	0	0	0	0	0	35
Royal Tern	1	0	0	0	0	0	0	1
Sooty Tern	0	493	490	4	848	478	0	2313
Fairy Tern	0	0	15	5	38	3	0	61
Tern	0	1	0	1	9	0	0	11
Cassin's Auklet	3	0	0	0	0	0	0	3
Bird sp.	2	2	4	0	0	2	0	10
TOTAL	343	1086	584	19	994	788	103	3917

TABLE 3. SUMMARY OF AREA A
32°39'N 117°14'W
20°35'N 118°28'W

AREA A	January 24	25	26	27	28	Total
Arctic Loon	1					1
Black-footed Albatross	0	2	6	4	2	14
Manx Shearwater	2	1	0	1	1	5
Shearwater Petrel	0	0	3	1	4	8
Pterodroma	0	0	0	0	1	1
Leach's Storm Petrel	0	1	3	4	8	16
Leach's Type	0	5	15	9	82	111
Storm Petrel	0	4	4	8	9	25
Red-billed Tropicbird	0	0	0	1	0	1
Brown Pelican	28	0	0	0	0	28
Cormorant	9	0	0	0	0	9
Surf Scoter	57	0	0	0	0	57
Phalarope	2	0	0	0	4	6
Jaeger	0	0	1	0	1	2
Western Gull	4	0	0	0	0	4
Herring Gull	0	4	0	0	0	4
California Gull	1	1	0	0	0	2
Ringbilled Gull	1	0	0	0	0	1
Heermann's Gull	6	0	0	0	0	6
Black-legged Kittiwake	1	0	0	0	0	1
Gull sp.	35	0	0	0	0	35
Royal Tern	1	0	0	0	0	1
Cassin's Auklet	3	0	0	0	0	3
Bird	0	0	2	0	0	2
TOTAL	151	18	34	28	112	343

AREA A (cont.)

January	No. of Birds	No. of Sightings	No. of Species	No. of Birds in Flocks	No. of Birds Not in Flocks	No. of Flocks	No. of Hours	No. of Miles
24	151	32	13	86	65	5	1.75	18
25	18	16	5	0	18	0	19.33	70
26	34	28	4	0	34	0	10.67	110
27	28	26	5	0	28	0	10.75	90
28	112	54	6	38	74	4	10.80	93
Totals	343	156	19	124	219	9	33.30	381

FLOCK COMPOSITION

Species	No.	% of Population in Flocks	% of Birds in Flocks	No. of Flocks Species Present In
Leach's Type	31	27.9	25	3
Leach's Petrel	7	43.7	5.6	1
Brown Pelican	8	28.5	6.4	2
Surf Scoter	50	87.7	40.3	1
Larus sp.	28	80.0	22.5	2
Totals	124	100%		

TABLE 4. SUMMARY OF AREA B
19°19'N 119°W
0°23'N 119°W

Species	29 January	30 January	31 January	1 February	2 February	3 February	4 February	5 February	6 February	Totals
Black-footed Albatross	3	0	0	0	0	0	0	0	0	3
Wedge-tailed Shearwater	0	0	0	47	16	8	4	9	0	84
Manx Shearwater	4	2	2	0	0	1	0	0	0	9
Juan Fernandez Petrel	0	0	0	0	0	18	11	1	0	30
Pterodroma externa	0	0	0	0	0	8	17	0	0	25
Tahiti Petrel	0	0	0	0	0	1	1	1	0	3
Kermadec Petrel	0	1	0	0	0	0	0	1	0	2
Phoenix Island Petrel	0	0	0	0	0	0	0	1	0	1
Phoenix Island or Tahiti Petrel	0	0	0	0	0	0	1	0	0	1
Pterodroma	0	0	0	0	0	2	2	0	0	4
Shearwater Petrel	2	0	0	2	1	7	11	5	0	28
Leach's Storm Petrel	5	5	29	0	2	2	3	6	5	57
Leach's Type	22	58	88	34	10	9	10	25	27	283
Storm Petrel	10	6	7	0	2	0	0	1	0	26
Red-tailed Tropicbird	0	0	4	9	2	2	1	2	0	20
Tropicbird	0	1	0	0	0	0	0	0	0	1
Blue-faced Booby	0	2	1	0	0	0	0	0	0	3
Red-footed Booby	0	0	0	0	1	0	0	0	0	1
Frigatebird	0	0	0	0	0	0	1	0	0	1
Phalarope	0	2	0	0	0	0	0	0	0	2
Pomarine Jaeger	0	0	0	0	0	1	0	0	0	1
Jaeger sp.	0	0	0	2	0	1	1	0	1	5
Sooty Tern	0	0	0	291	175	6	1	15	5	493
Tern sp.	0	0	0	0	1	0	0	0	0	1
Bird	1	0	0	1	0	0	0	0	0	2
TOTALS	47	77	131	386	210	66	64	67	38	1086

AREA B (cont.)

January	No. of Birds	No. of Sightings	No. of Species	No. of Birds in Flocks	No. of Birds Not in Flocks	No. of Flocks	No. of Hours	No. of Miles
29	47	41	3	0	47	0	11.25	33
30	77	46	6	20	57	1	11.25	84
31	131	76	4	26	105	4	11.00	81
February								
1	368	58	5	318	50	8	11.67	70
2	210	30	5	179	31	2	10.00	20
3	66	52	8	6	60	1	11.50	86
4	64	62	8	0	64	0	11.10	63
5	67	41	8	23	44	2	11.00	73
6	38	26	3	0	38	0	11.40	66
TOTALS	1068	432	15	572	496	18	100.17	576

FLOCK COMPOSITION

Species	No.	% of Population in Flocks	% of Birds in Flocks	No. of Flocks Species Present In
Wedge-tailed Shearwater	40	47.6	6.9	5
Leach's Storm Petrel	11	19.2	1.9	2
Leach's Type	42	14.8	7.3	4
Sooty Tern	479	97.1	83.7	12
TOTAL	572			

TABLE 5. SUMMARY OF AREA C
0°43'S 119°W
19°40'S 119°03'W

Species	7 February	8 February	9 February	10 February	11 February	12 February	13 February	14 February	Totals
Herald Petrel	0	0	0	0	1	0	0	0	1
Cook's Petrel	0	1	0	0	0	0	0	0	1
White-winged Petrel	0	0	0	0	1	0	0	0	1
Pterodroma	0	0	0	1	0	0	0	1	2
Shearwater-Petrel	1	0	1	1	1	1	0	1	6
Leach's Storm Petrel	0	5	0	0	1	0	0	0	6
Leach's Type	3	15	0	1	0	1	0	0	20
White-throated Storm Petrel	0	0	0	3	0	1	0	0	4
Storm Petrel	0	0	0	0	0	1	0	0	1
Red-tailed Tropicbird	0	0	1	1	1	3	5	0	11
White-tailed Tropicbird	0	0	0	0	0	1	1	0	2
Tropicbird	0	0	0	0	0	1	1	0	2
Red-footed Booby	0	0	1	0	0	0	0	0	1
Frigatebird	0	1	0	0	4	0	0	0	5
Phalarope	0	0	0	0	0	0	3	3	6
Pomarine Jaeger	0	0	0	0	0	2	0	0	2
Jaeger sp.	0	0	0	0	0	0	2	0	2
Sooty Tern	0	7	100	42	161	180	0	0	490
Fairy Tern	0	1	0	0	6	2	6	0	15
Bird	0	0	0	0	1	0	3	0	4
Shorebird	0	0	0	0	0	0	0	2	2
TOTALS	4	30	103	49	177	193	21	7	584

AREA C (cont.)

February	No. of Birds	No. of Sightings	No. of Species	No. of Birds in Flocks	No. of Birds Not in Flocks	No. of Flocks	No. of Hours	No. of Miles
7	4	4	2	0	4	0	10.00	66
8	30	20	5	7	23	1	11.25	72
9	103	9	4	95	8	4	12.10	79
10	49	8	5	42	7	1	10.40	65
11	177	11	7	170	7	4	10.50	72
12	193	16	7	179	14	4	11.80	81
13	21	18	5	0	21	0	11.20	83
14	7	6	2	0	7	0	11.40	70
TOTALS	584	92	12	493	86	14	88.65	588

FLOCK COMPOSITION

Species	No.	% of Population in Flocks	% of Birds in Flocks	No. of Flocks Species Present In
Frigatebird	4	80	.8	2
Sooty Tern	482	98.3	97.7	14
Fairy Tern	7	46.6	1.4	3
Total	493			

TABLE 6. SUMMARY OF AREA D
20°03'S 119°52'W
19°59'S 125°09'W

Species	15 February	16 February	Totals
Herald Petrel	0	1	1
Murphy's Petrel	0	3	3
Shearwater Petrel	1	0	1
Pterodroma	0	2	2
Red-tailed Tropicbird	0	1	1
Phalarope	1	0	1
Sooty Tern	4	0	4
Fairy Tern	2	3	5
Tern	0	1	1
TOTALS	8	11	19

February	No. of Birds	No. of Sightings	No. of Species	No. of Birds in Flocks	No. of Birds Not in Flocks	No. of Flocks	No. of Hours	No. of Miles
15	8	5	4	0	8	0	11.67	105
16	11	9	4	0	11	0	11.20	98
TOTALS	19	14	6	0	19	0	22.87	203

TABLE 7. SUMMARY OF AREA E
19°17'S 125°56'W
17°45'S 126°W

Species	February 17	February 18	February 19	February 20	February 21	February 22	February 23	Totals
Pterodroma externa	0	0	1	0	0	0	0	1
Herald Petrel	0	0	1	1	0	0	0	2
Pterodroma	0	2	0	0	0	0	0	2
Shearwater-Petrel	2	0	1	0	0	0	0	3
Leach's Storm Petrel	0	0	0	0	3	3	9	15
Leach's Type	0	0	0	0	0	9	12	21
White-throated Storm Petrel	0	0	0	1	3	0	0	4
Storm Petrel	0	0	0	0	1	2	0	3
Red-tailed Tropicbird	1	0	2	0	1	0	0	4
White-tailed Tropicbird	0	0	2	0	0	0	0	2
Blue-faced Booby	0	1	0	0	0	0	0	1
Great Frigatebird	0	0	1	0	0	0	0	1
Frigatebird	0	0	12	6	3	0	0	21
Red Phalarope	0	0	0	1	0	2	1	4
Phalarope	0	6	2	2	0	1	1	12
Long-tailed Jaeger	0	0	2	1	0	0	0	3
Sooty Tern	0	0	381	302	45	119	1	848
Fairy Tern	6	1	0	8	9	14	0	38
Bird	2	0	4	1	2	0	0	9
TOTALS	11	10	409	323	67	150	24	994

AREA E (cont.)

February	No. of Birds	No. of Sightings	No. of Species	No. of Birds in Flocks	No. of Birds Not in Flocks	No. of Flocks	No. of Hours	No. of Miles
17	11	9	3	0	11	0	11.60	82
18	10	7	4	0	10	0	10.70	95
19	409	20	8	394	15	6	12.00	96
20	323	15	7	307	16	6	11.30	94
21	67	14	6	44	23	2	10.90	106
22	150	24	4	129	21	8	10.50	86
23	24	17	3	0	24	0	10.50	82
TOTALS	994	106	12	874	120	22	77.50	641

FLOCK COMPOSITION

Species	No.	% of Population in Flocks	% of Birds in Flocks	No. of Birds Species Present In
Great Frigatebird	1	100	.1	1
Frigatebird	15	71.4	1.7	7
Long-tailed Jaeger	1	33.3	.1	1
Sooty Tern	839	98.9	95.9	22
Fairy Tern	18	47.3	2.0	3
TOTAL	874			

TABLE 8. SUMMARY OF AREA F
1°22'N 126°02'W
20°N 125°58'W

Species	24 February	25 February	26 February	27 February	28 February	1 March	2 March	Totals
Wedge-tailed Shearwater	4	1	5	7	1	0	0	18
Juan Fernandez Petrel	1	6	26	3	2	0	0	38
Pterodroma externa	2	4	6	0	0	0	0	12
Tahiti Petrel	1	4	1	0	0	0	0	6
Kermadec Petrel	1	2	0	2	1	0	0	6
Phoenix Island Petrel	1	0	0	0	0	0	0	1
Pterodroma	0	0	0	1	0	0	0	1
Shearwater-Petrel	0	6	10	3	3	1	0	23
Leach's Storm Petrel	25	1	1	8	0	3	2	40
Leach's Type	12	11	6	55	9	8	37	138
Red-tailed Tropicbird	0	0	5	2	2	0	0	9
Blue-faced Booby	0	0	0	1	0	0	0	1
Red Phalarope	2	0	1	0	0	0	0	3
Phalarope	1	0	1	0	0	0	0	2
Pomarine Jaeger	0	0	6	0	0	0	0	6
Jaeger	0	0	0	1	0	0	0	1
Sooty Tern	113	141	168	26	25	5	0	478
Fairy Tern	0	0	1	1	1	0	0	3
Bird	0	1	0	0	1	0	0	2
TOTALS	163	177	237	110	45	17	39	788

AREA F (cont.)

February	No. of Birds	No. of Sightings	No. of Species	No. of Birds in Flock	No. of Birds Not in Flocks	No. of Flocks	No. of Hours	No. of Miles
24	163	28	8	138	25	3	12.20	83
25	177	43	6	142	35	8	11.00	87
26	237	35	9	205	32	6	10.90	88
27	110	60	9	45	65	5	10.67	93
28	45	21	7	23	22	1	10.70	81
March								
1	17	10	3	5	12	1	10.90	95
2	39	27	1	7	32	1	10.80	84
TOTALS	788	224	12	565	223	25	77.17	611

FLOCK COMPOSITION

Species	No.	% of Population in Flocks	% of Birds in Flocks	No. of Birds Species Present In
Wedge-tailed Shearwater	5	27.7	.8	3
Juan Fernandez Petrel	21	55.2	3.7	2
Kermadec Petrel	1	16.6	.1	1
Shearwater-Petrel	13	56.5	2.3	4
Leach's Storm Petrel	31	77.5	5.4	2
Leach's Type	19	13.7	3.3	3
Pomarine Jaeger	3	50.0	.5	2
Sooty Tern	471	98.5	83.3	20
Fairy Tern	1	33.3	.1	1
TOTAL	565			

TABLE 9. SUMMARY OF AREA G
21°40'N 125°40'W
32°27'N 117°23'W

Species	3 March	4 March	5 March	6 March	Totals
Black-footed Albatross	0	0	0	2	2
Laysan Albatross	0	0	1	0	1
Sooty Shearwater	0	0	1	0	1
Manx Shearwater	2	0	0	0	2
Cook's Petrel	0	6	1	0	7
Pterodroma	0	1	0	0	1
Shearwater-Petrel	2	0	0	0	2
Leach's Storm Petrel	2	0	0	0	2
Leach's Type	26	5	9	0	40
Brown Pelican	0	0	0	1	1
Red Phalarope	0	0	10	0	10
Phalarope	0	1	5	0	6
Western Gull	0	0	0	10	10
Herring Gull	0	0	0	13	13
California Gull	0	0	0	3	3
Ring-billed Gull	0	0	0	1	1
Black-legged Kittiwake	0	0	0	1	1
TOTALS	32	13	27	31	103

March	No. of Birds	No. of Sightings	No. of Species	No. of Birds in Flocks	No. of Birds Not in Flocks	No. of Flocks	No. of Hours	No. of Miles
3	32	30	2	0	32	0	8.67	91
4	13	12	3	0	13	0	7.90	92
5	27	17	5	10	17	1	7.10	101
6	31	7	7	0	31	0	5.75	70
TOTALS	103	66	13	10	93	1	29.42	354

FLOCK COMPOSITION

Species	No.	% of Population in Flocks	% of Birds in Flocks	No. of Flocks Species Present In
Red Phalarope	10	100	100	1

TABLE 10. SUMMARY OF NOCTURNAL OBSERVATIONS

Date	No. of Hours	No. of Birds	Position	Species Seen
31 January	1.00	0	13°12'N 119°W	- - -
	1.00	1	12°36'N 119°W	Tropicbird
1 February	1.50	1	10°13'N 118°55'W	Bird
3 February	3.00	2	6°05'N 118°51'W	Sooty Tern (1) immature + Leach's Type (1)
4 February	0.75	2	6°05'N 118°51'W	Leach's Storm Petrel (1) + Leach's Type (1)
	1.50	5	4°23'N 118°55'W	Leach's Storm Petrel (1) + Leach's Type (1) + Sooty Tern (3) 2 immatures
7 February	2.00	0	2°38'S 119°02'W	- - -
9 February	1.50	1	7°42'S 118°57'W	Shearwater-Petrel
10 February	0.50	0	7°42'S 118°57'W	- - -
14 February	1.00	0	20°S 119°W	- - -
18 February	0.75	0	14°14'S 126°W	- - -
27 February	0.50	2	12°04'N 126°W	Wedge-tailed Shearwater (1) + Sooty Tern (1) immature
28 February	0.25	0	14°49'N 126°W	- - -
TOTALS	15.25	14		

Figure 1. Daily Noon Positions

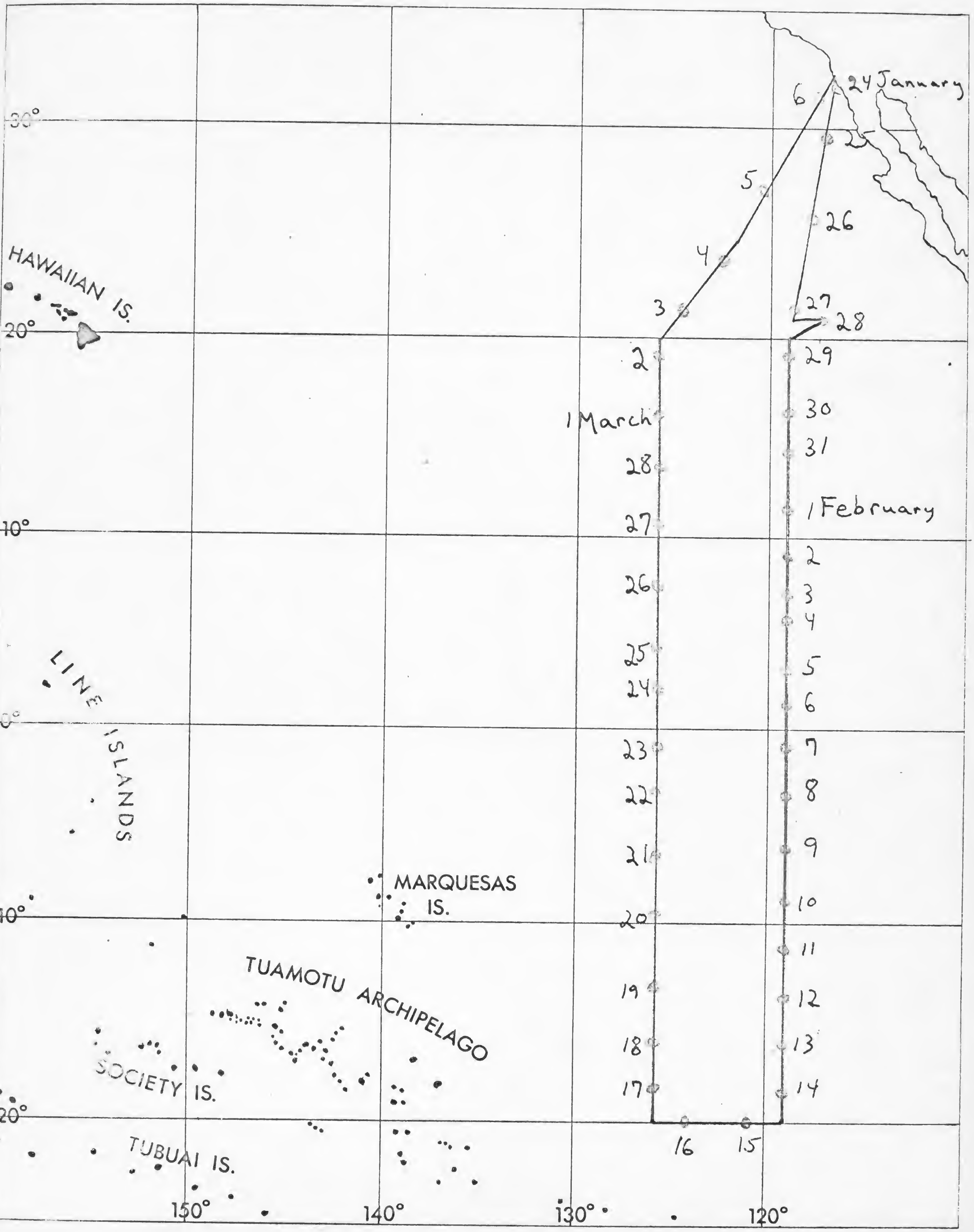


Figure 2. Daily Abundance of Birds

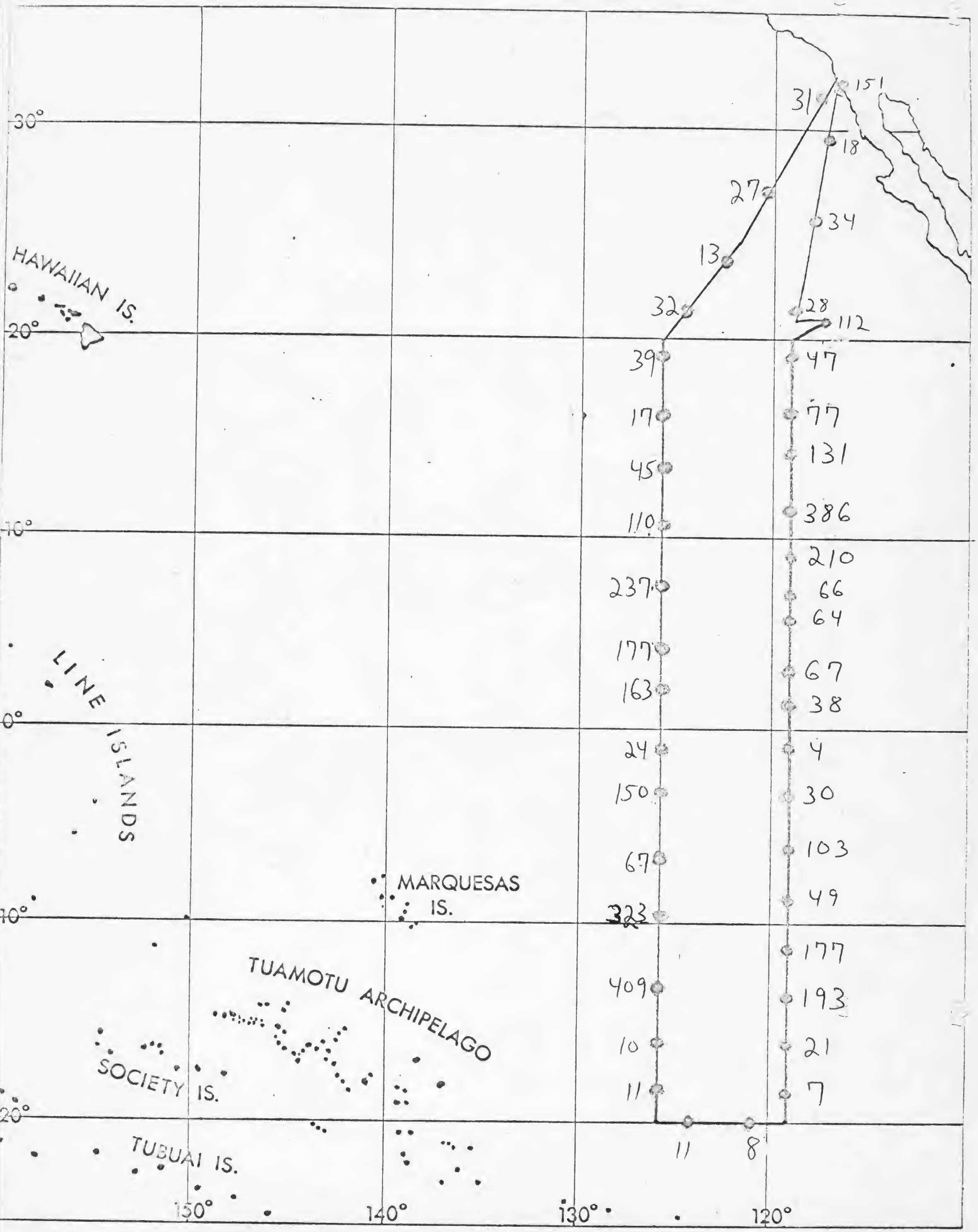


Figure 3. Abundance of Shearwater-Petrels

(Dark area is the area of greatest abundance)

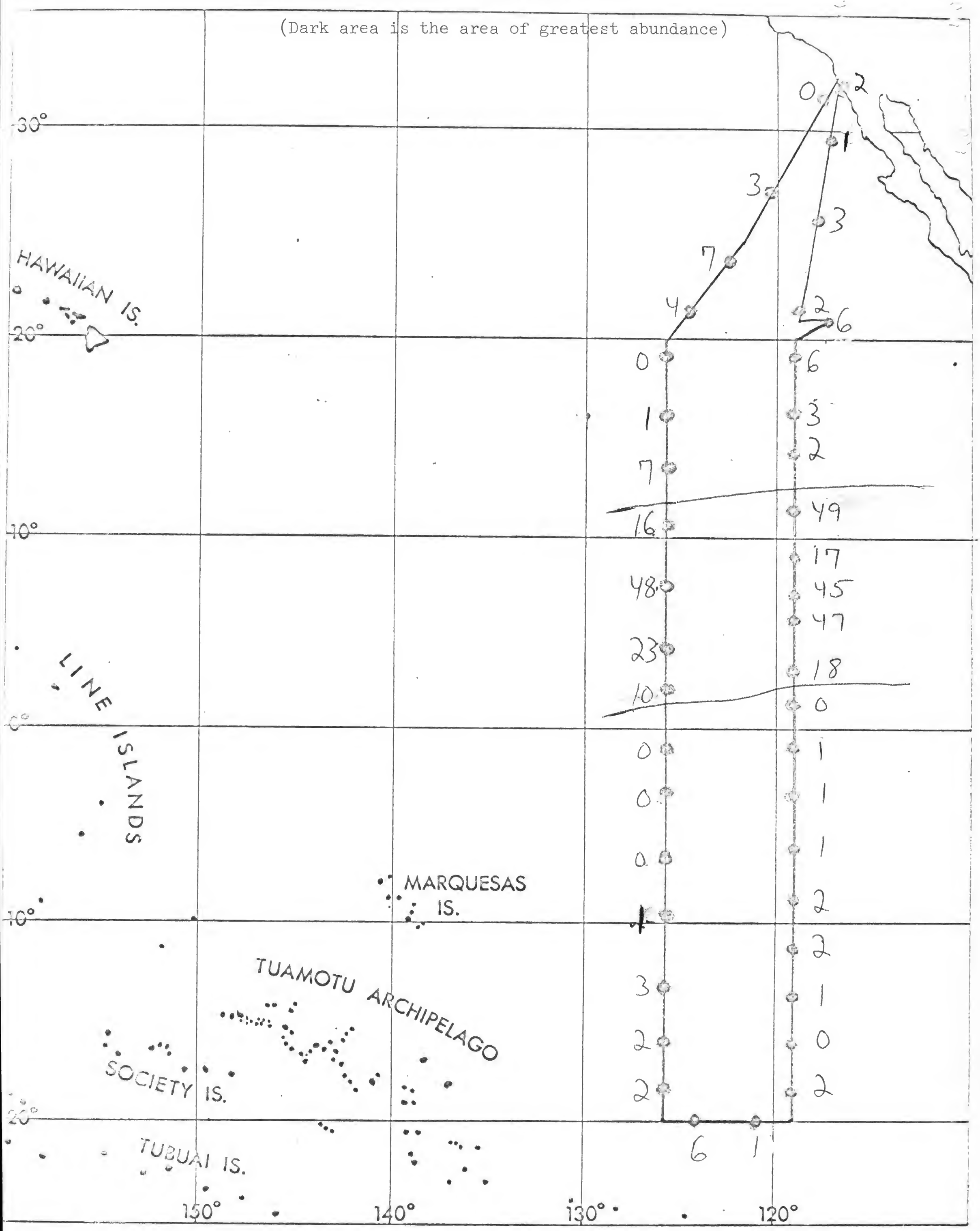


Figure 4. Daily Abundance of Cetaceans

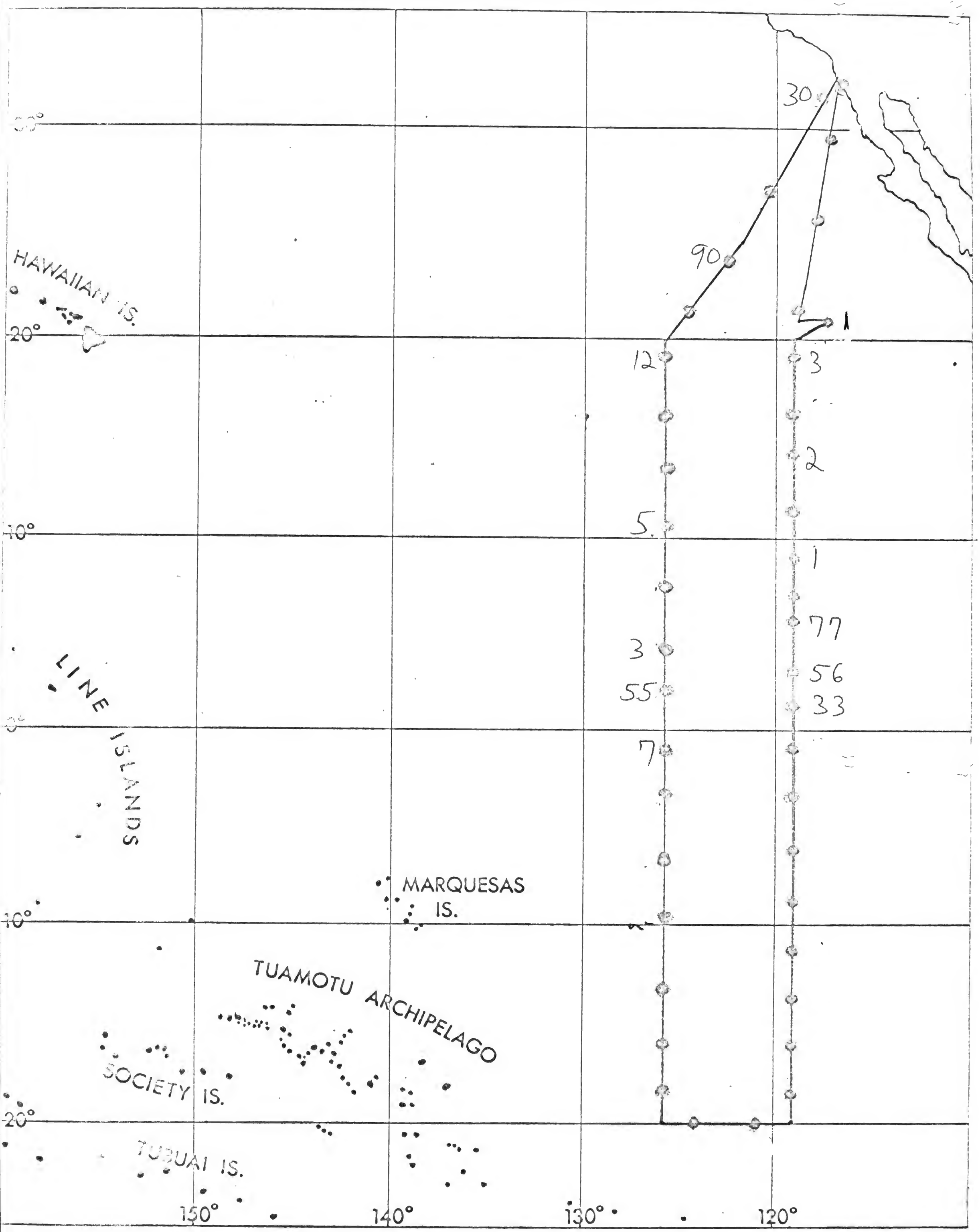


Figure 5. Daily Abundance of Flocks

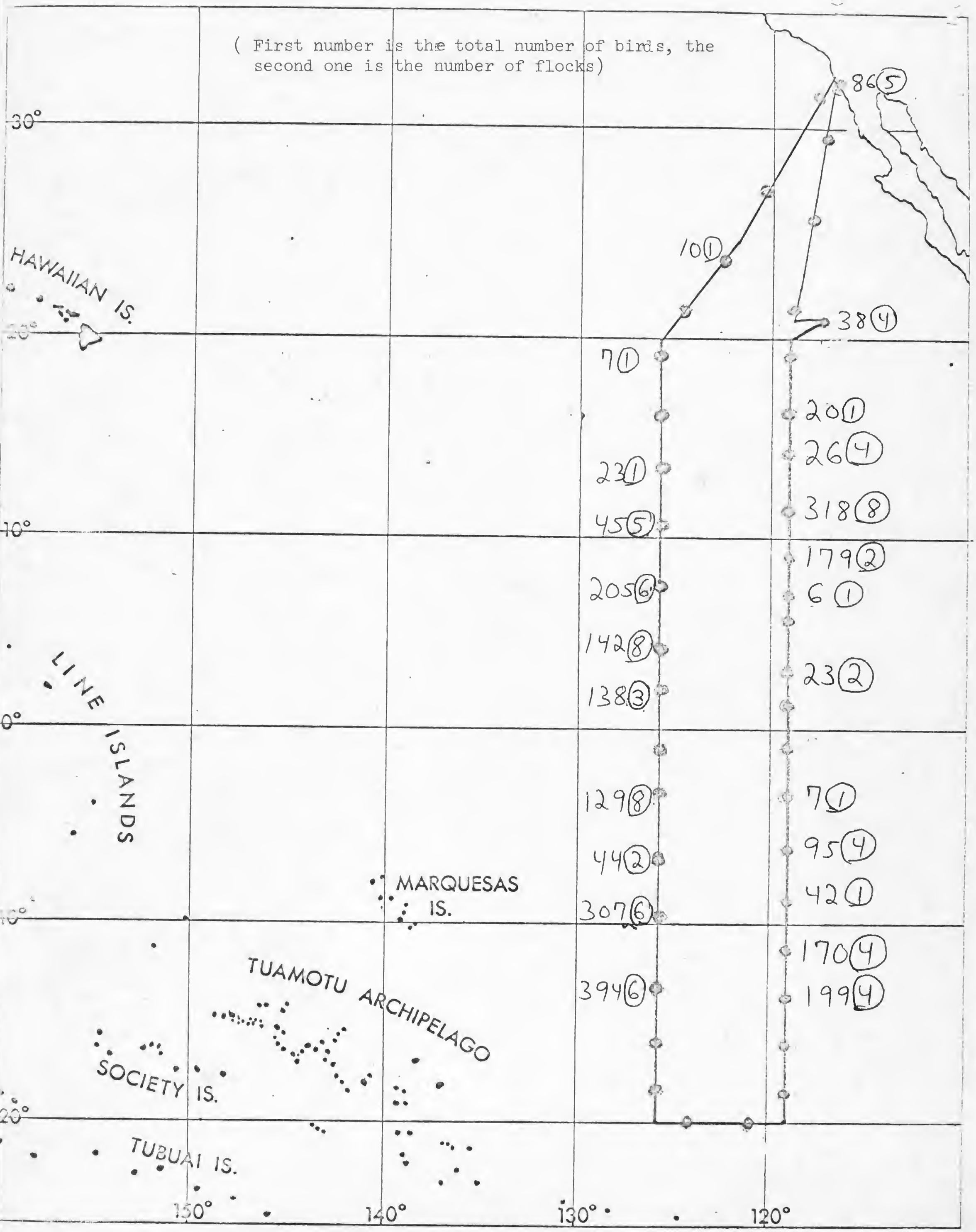


Figure 6. Daily Abundance of Feeding Flocks

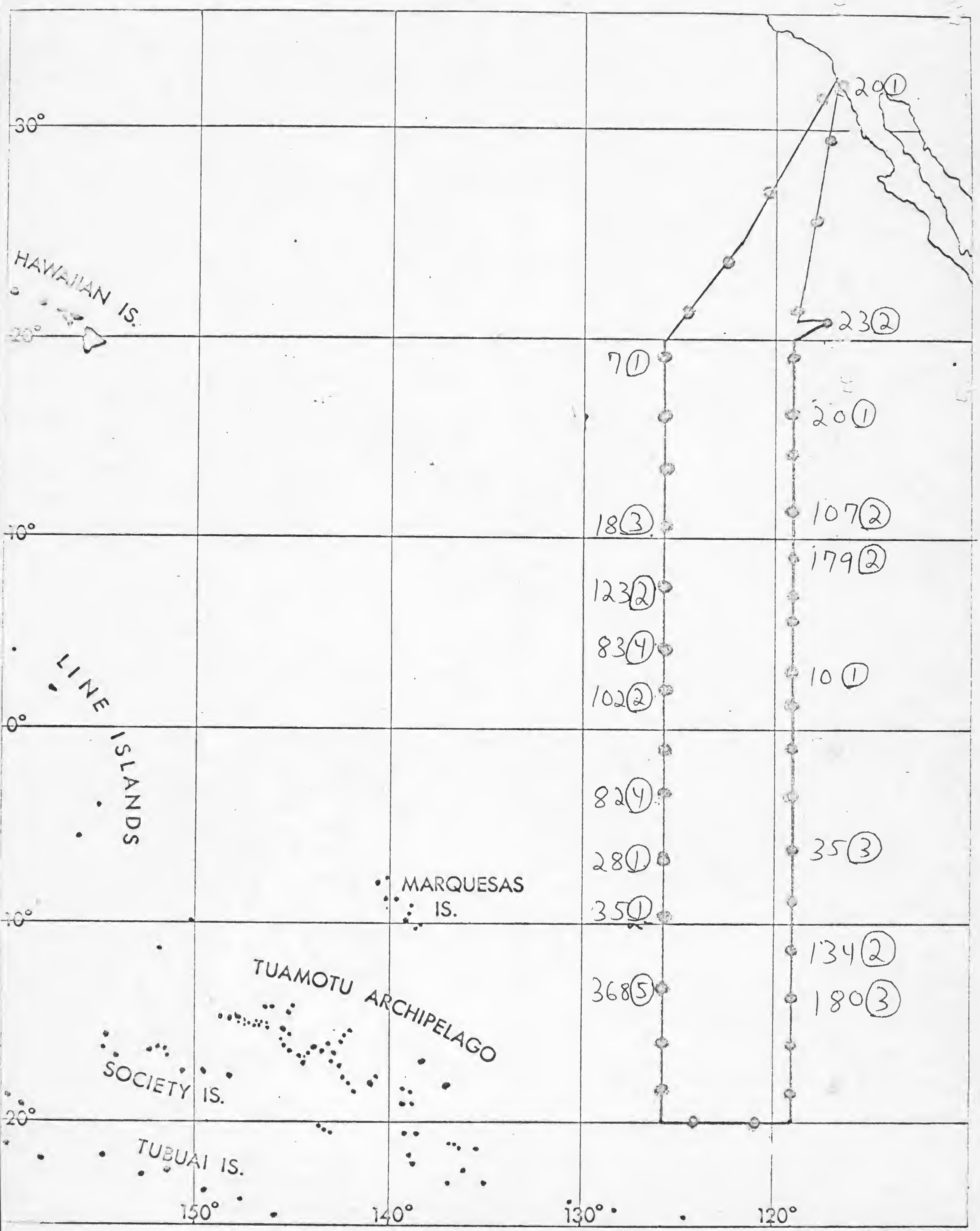


Figure 7. Daily Abundance of Flocks that could be associated with Tuna Schools

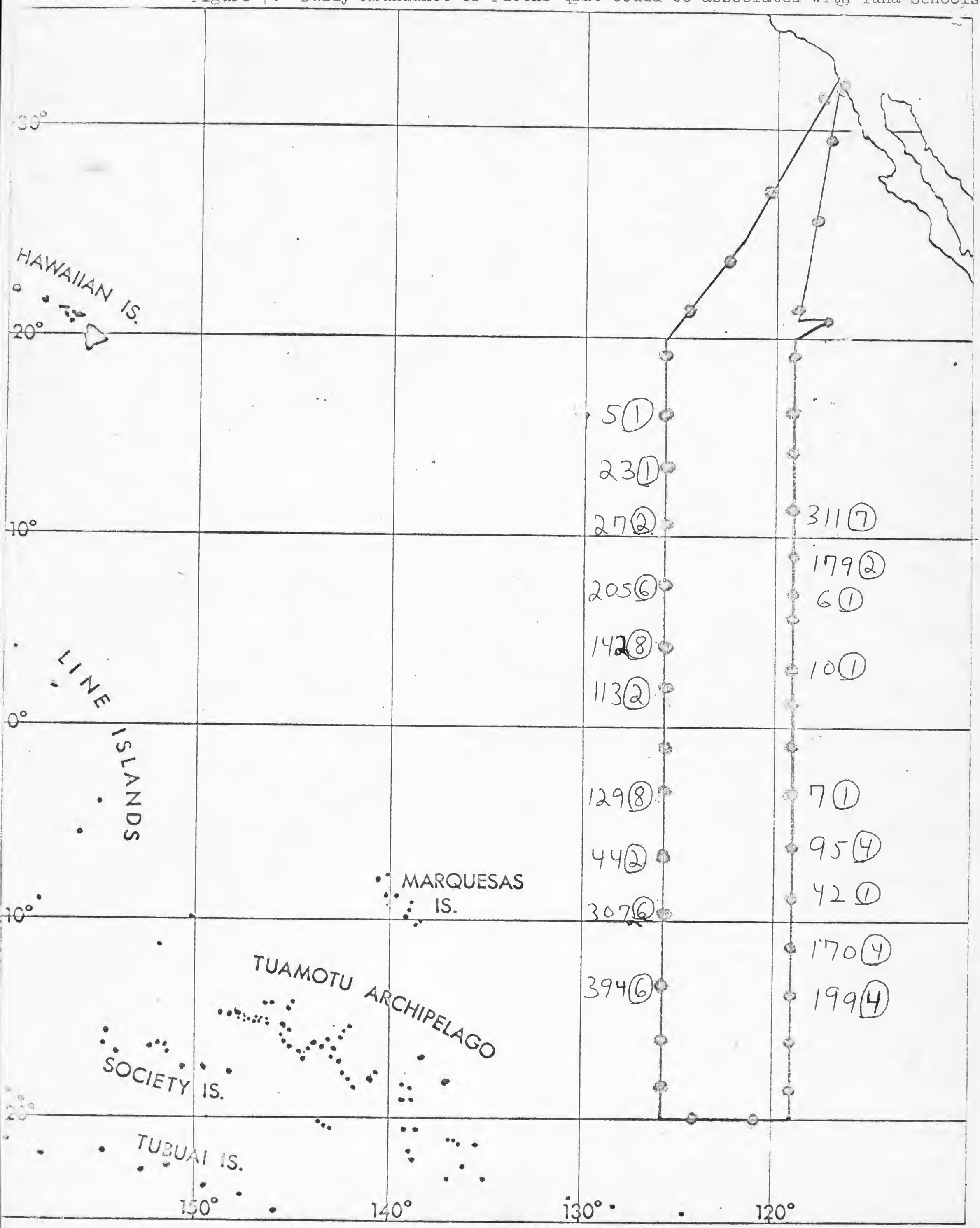


Figure 8. Daily Abundance of Flocks of Plankton-Feeding Birds

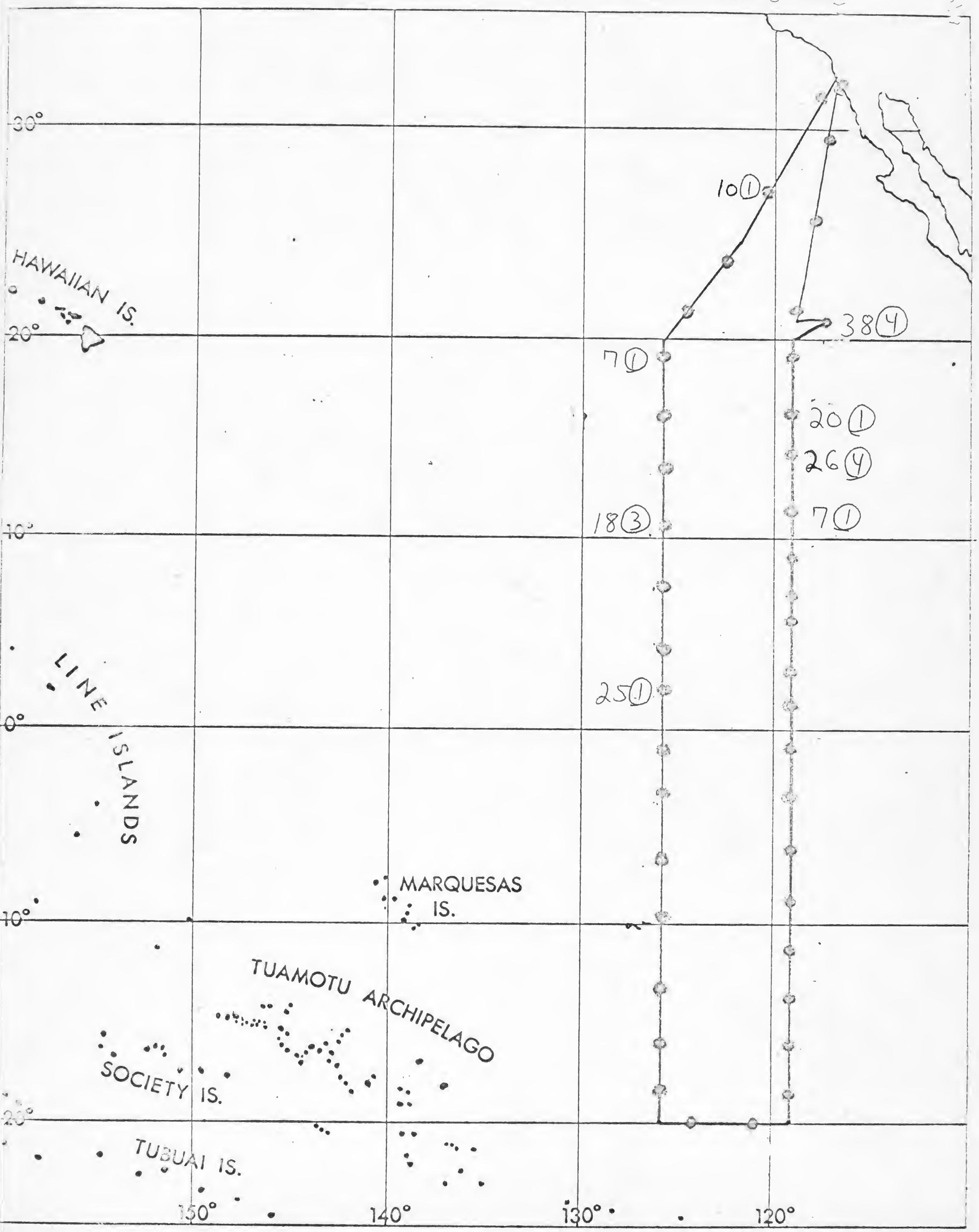


Figure 9. Daily Abundance of Wedge-tailed Shearwaters

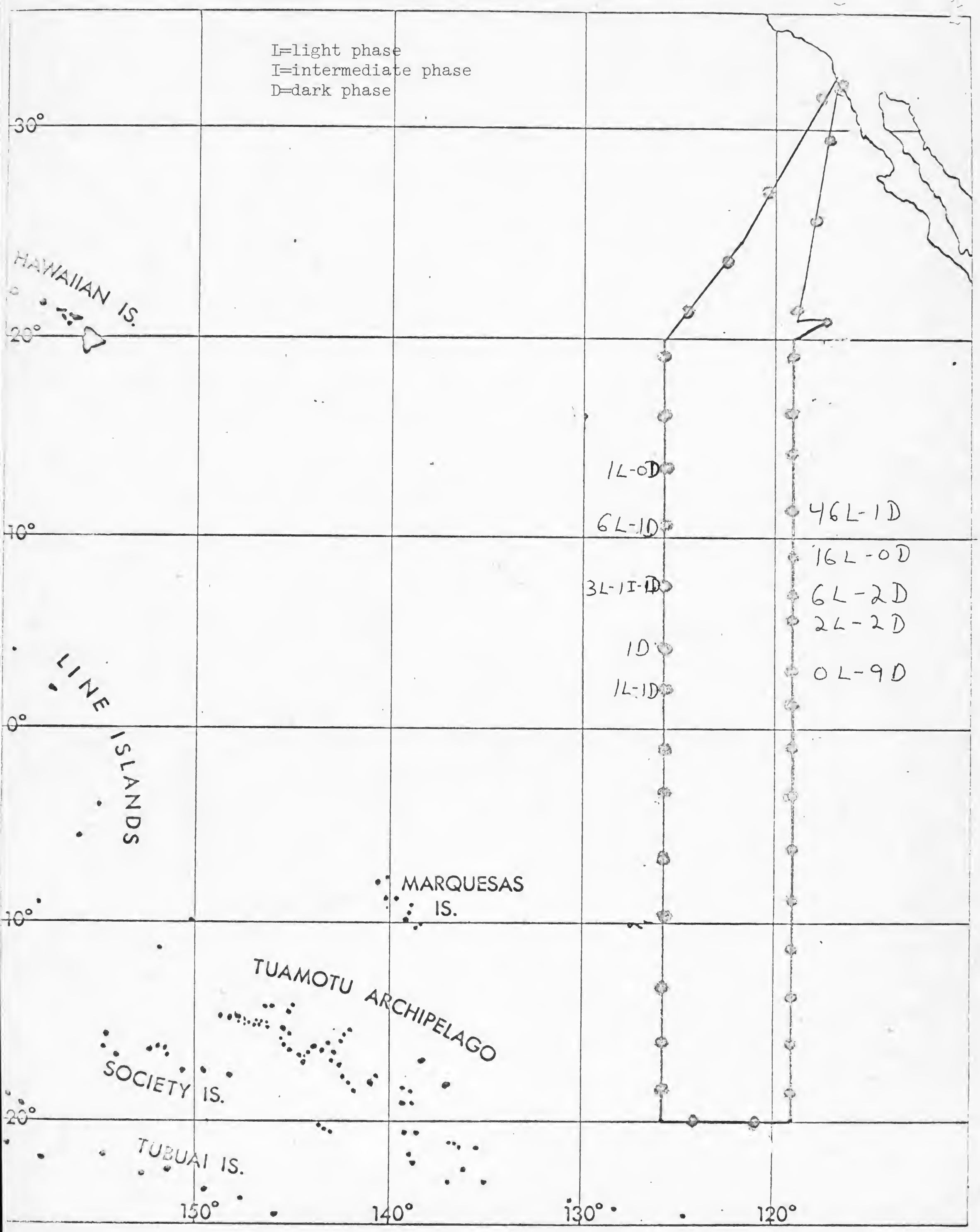


Figure 10. Daily Abundance of Juan Fernandez Petrels(including P. externa)

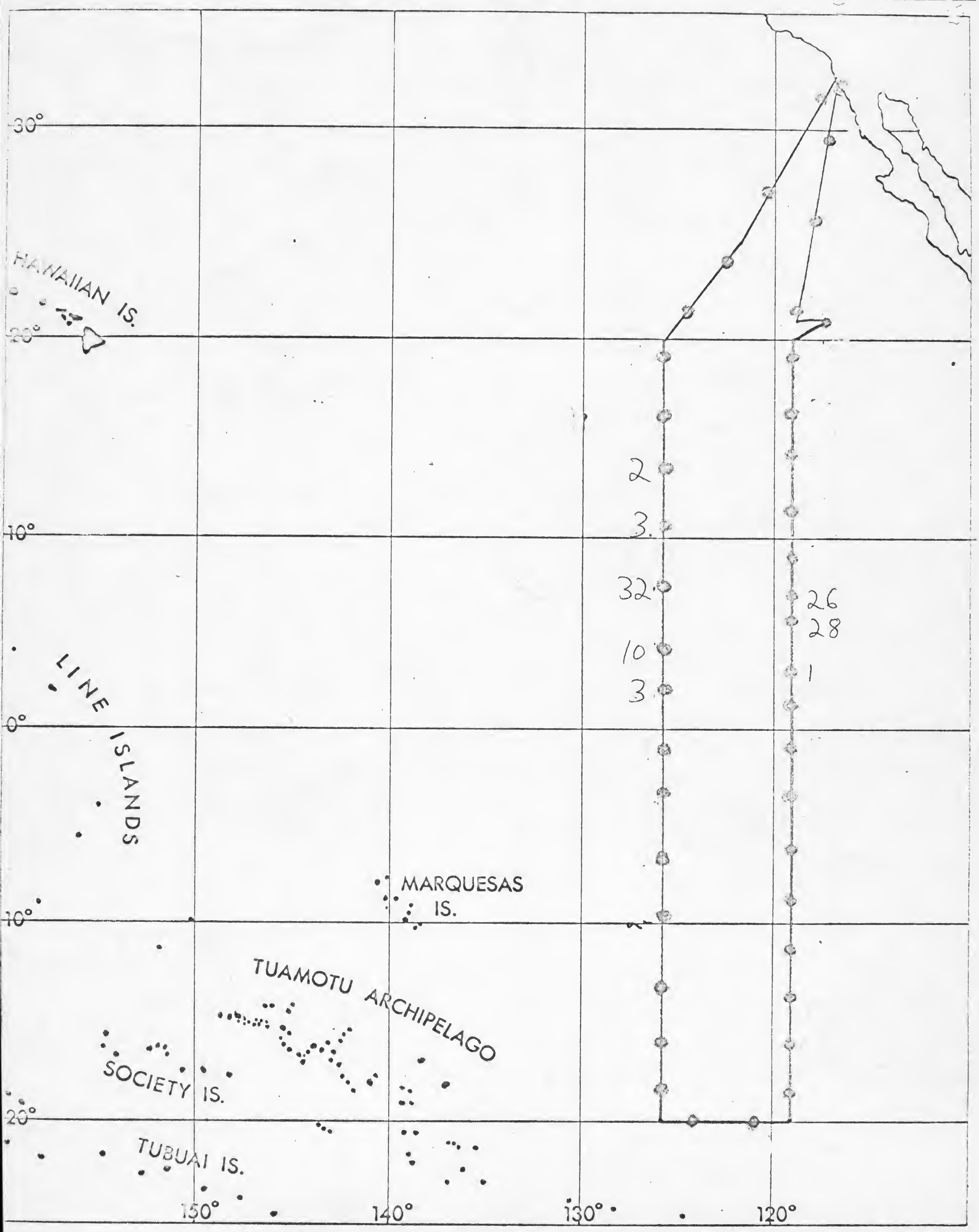


Figure 11. Daily Abundance of Tahiti and Phoenix Petrels

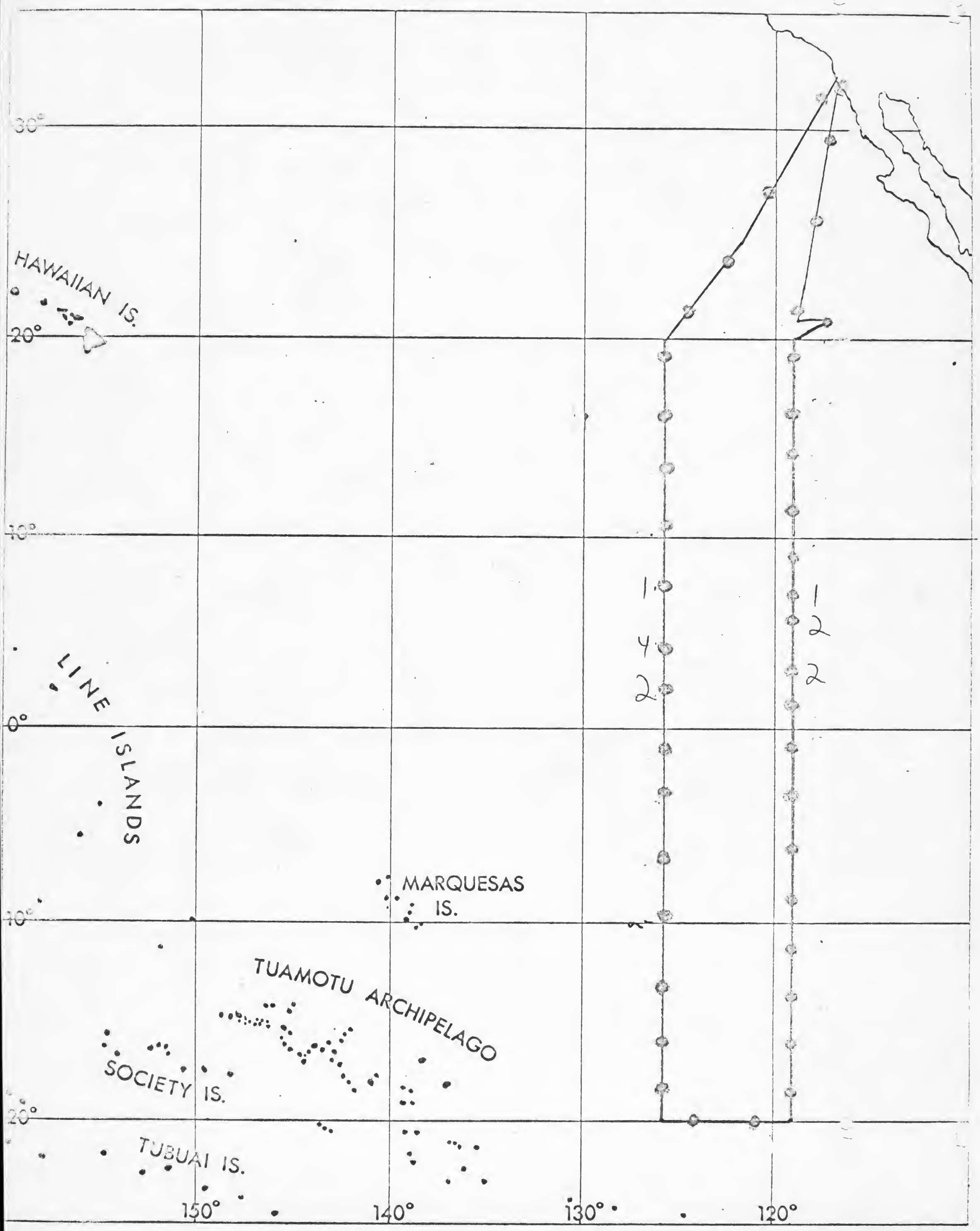


Figure 12. Daily Abundance of Kermadec Petrels(K) and Herald Petrels(H)

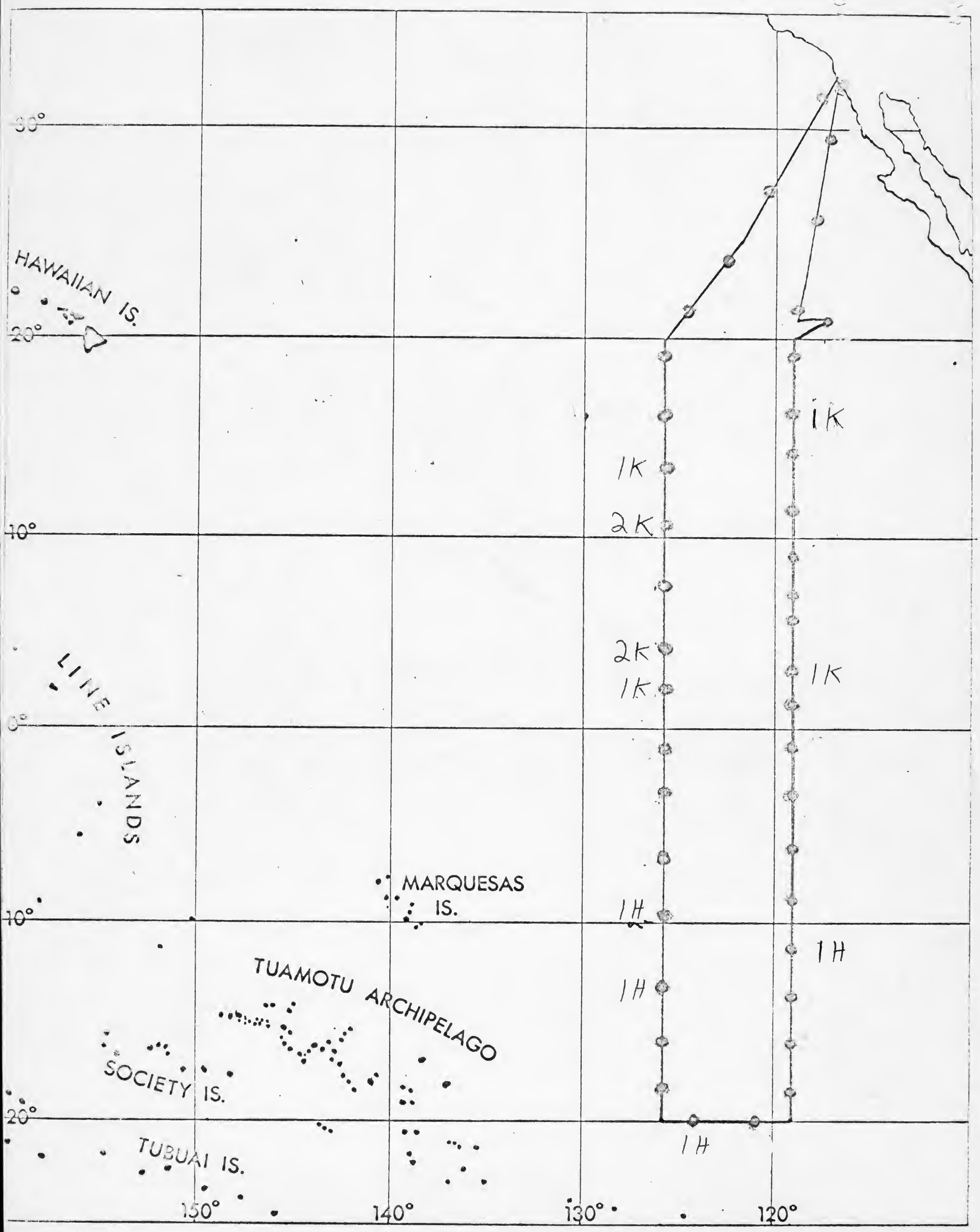


Figure 13. Daily Abundance of Leach's Storm Petrels(including Leach's Type)

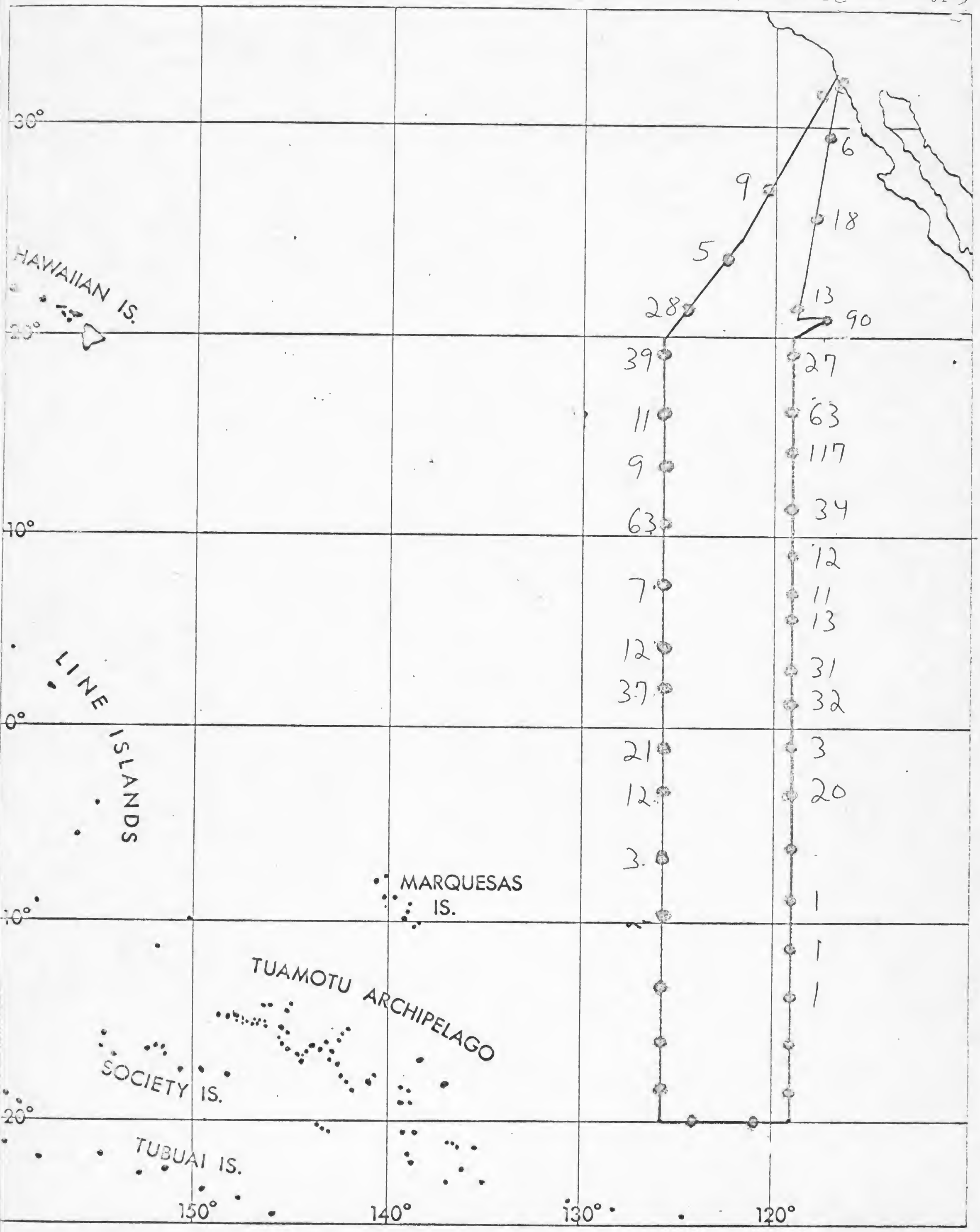


Figure 14. Daily Abundance of Red-tailed Tropicbird

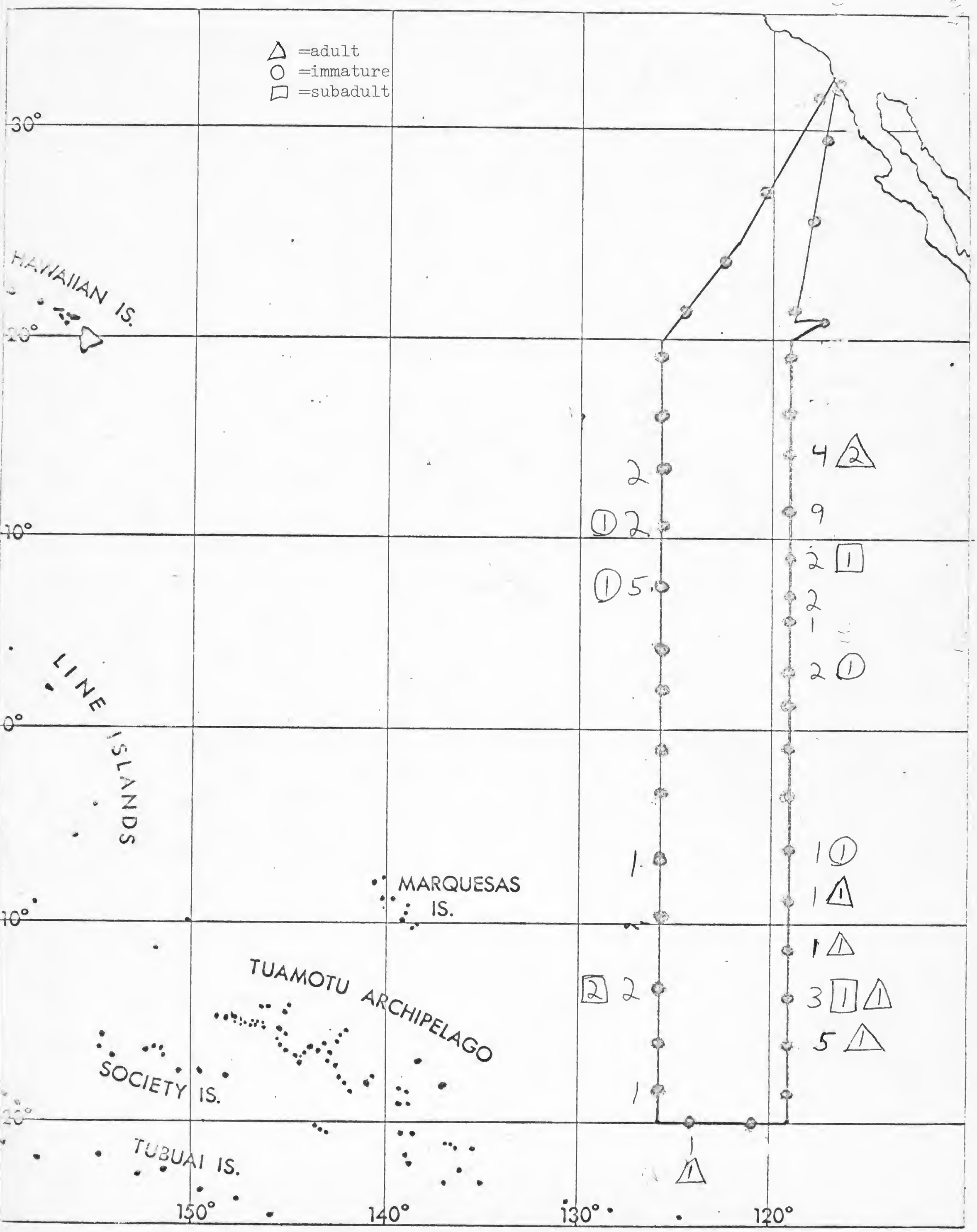


Figure 15. Daily Abundance of Frigatebirds

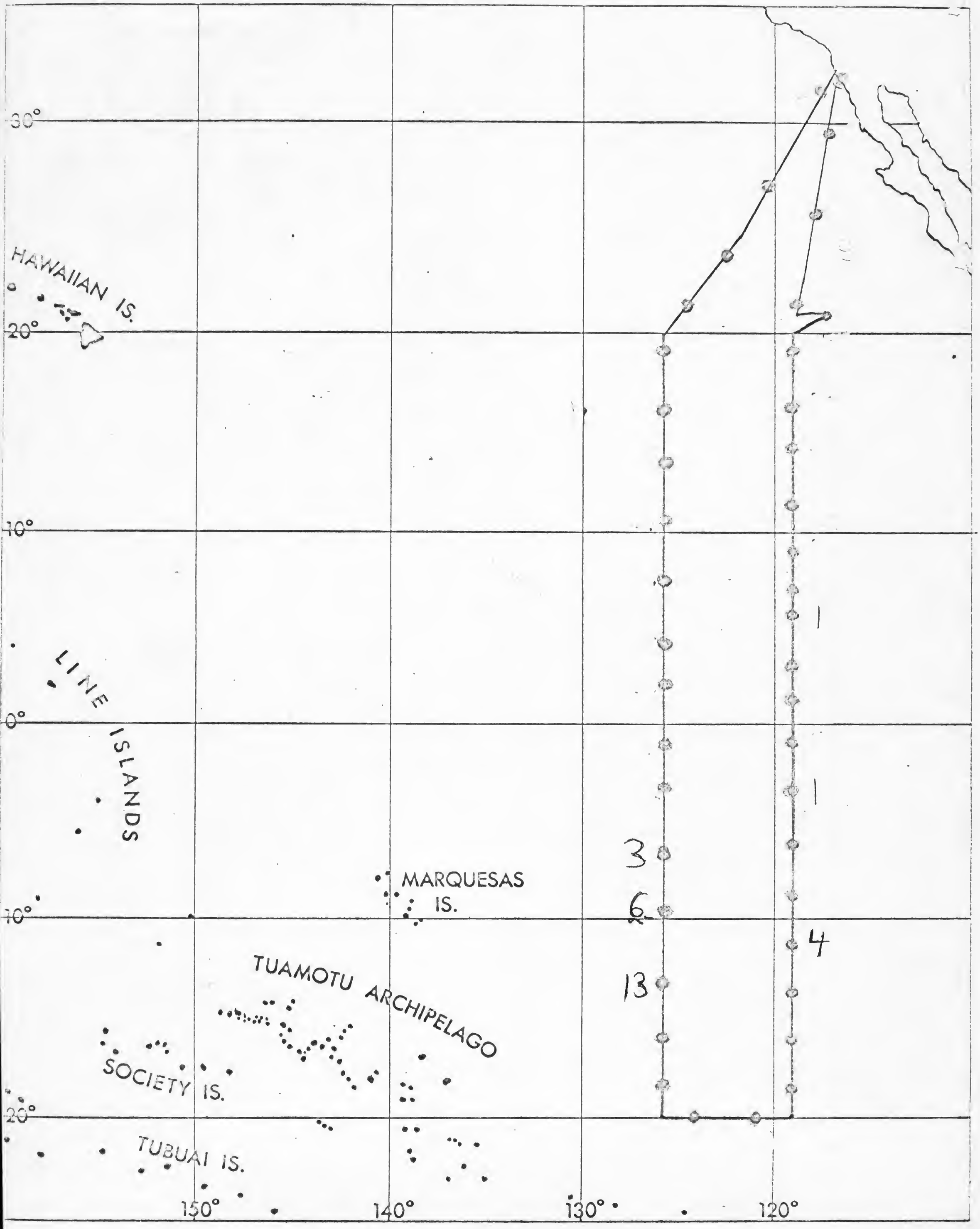


Figure 16. Daily Abundance of Phalaropes

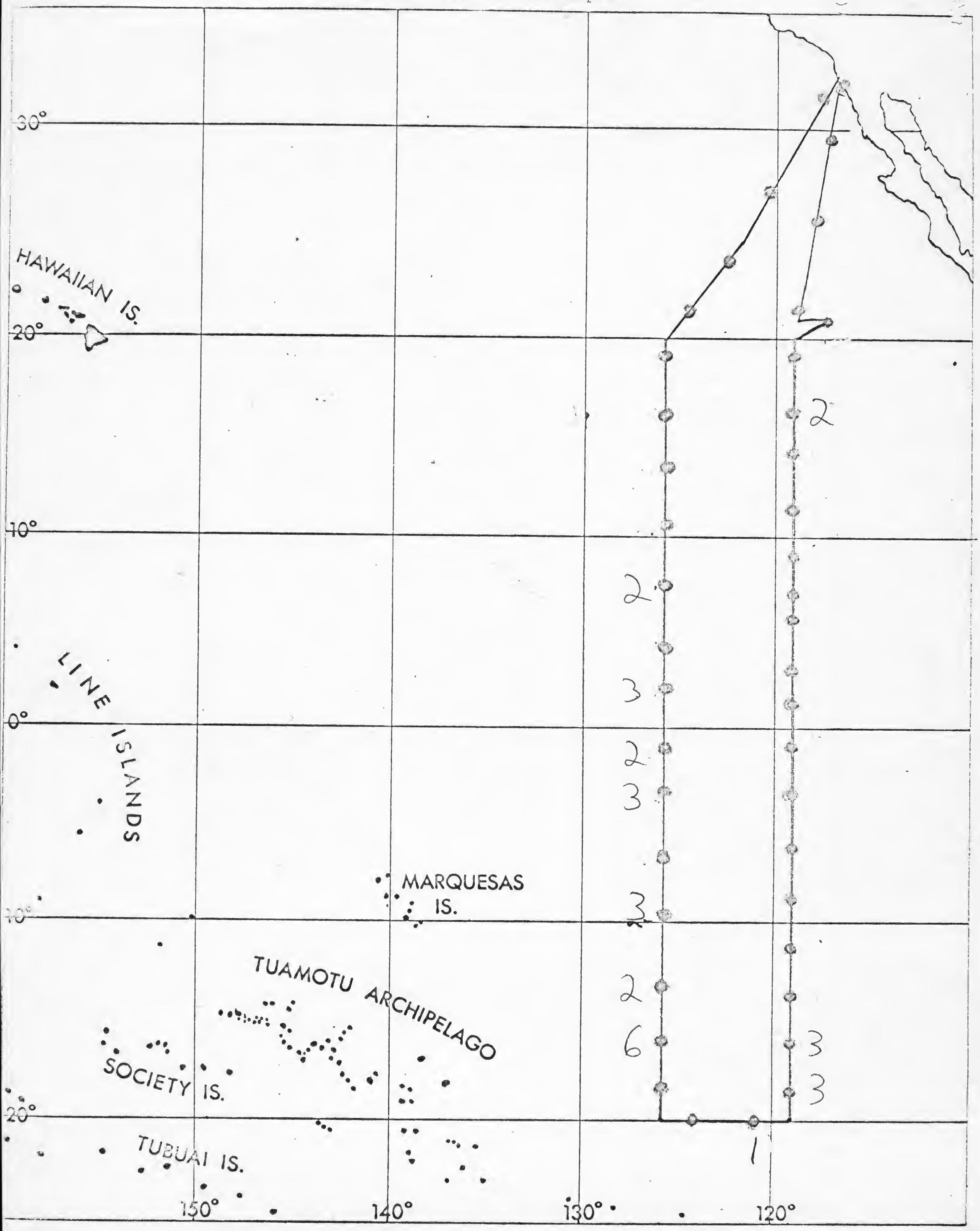


Figure 17. Daily Abundance of Jaegers

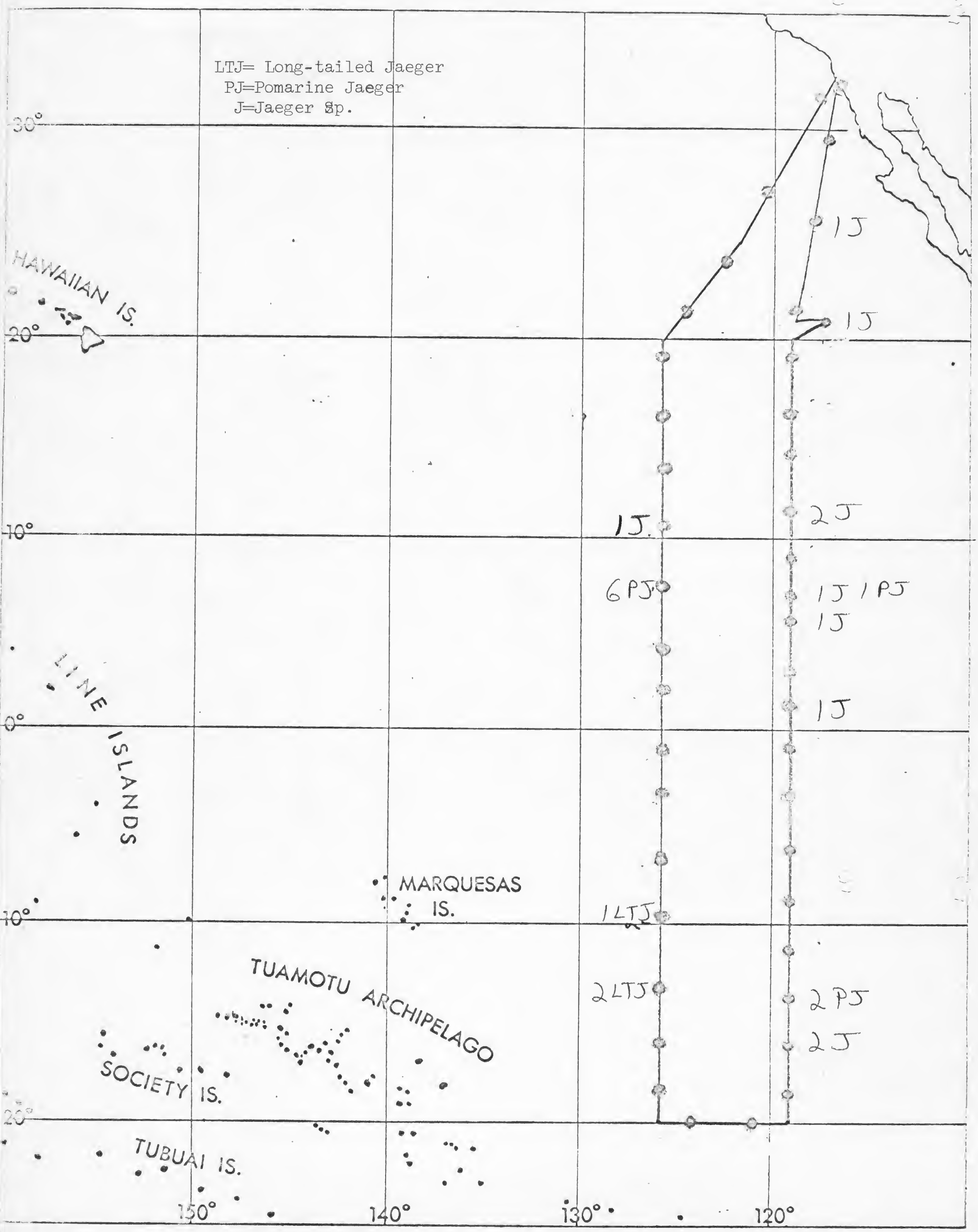


Figure 18. Daily Abundance of Sooty Terns

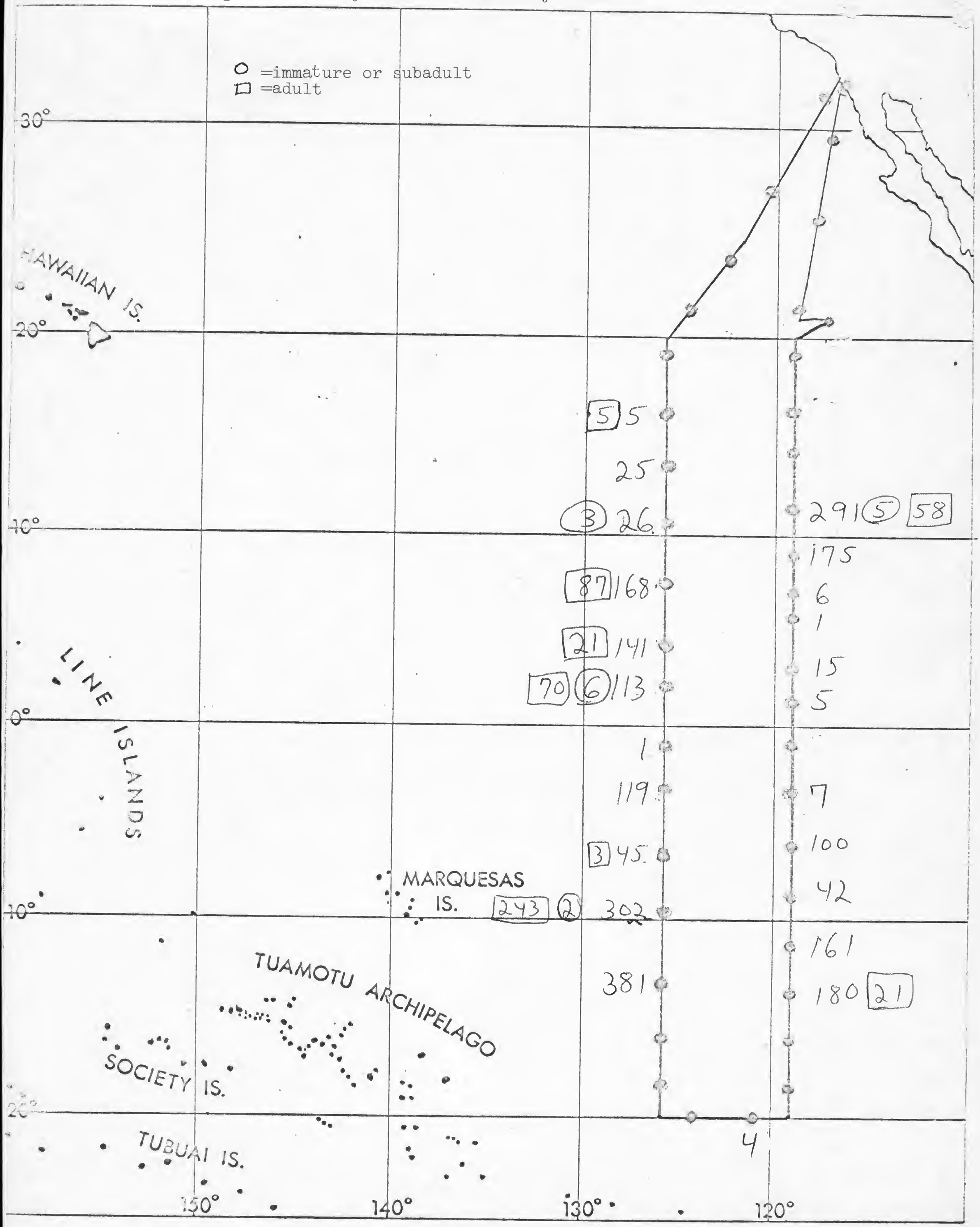
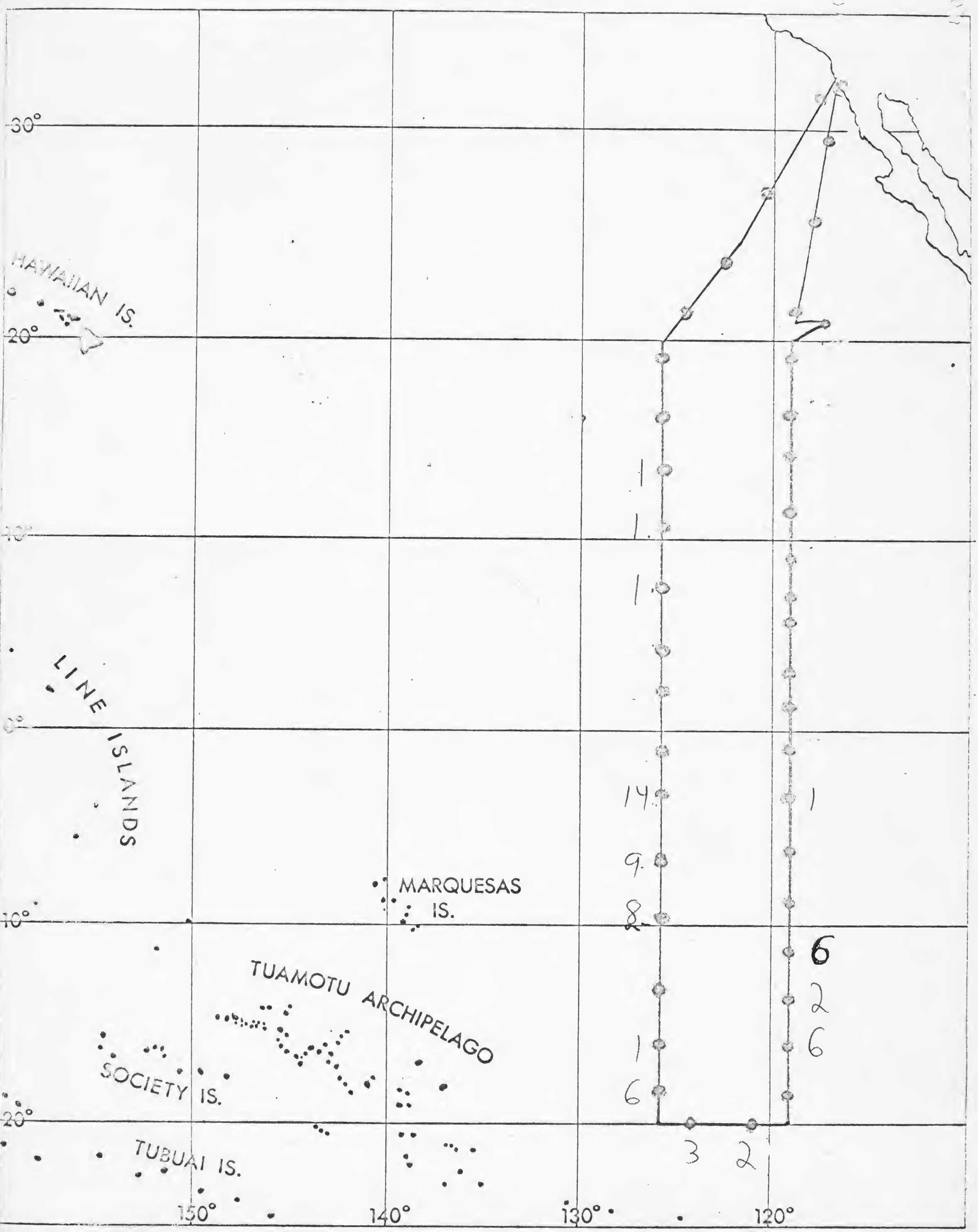


Figure 19. Daily Abundance of Fairy Terns



APPENDIX A.

Scientific Party

Dr. Maurice Blackburn - Leader - S.I.O.
Dr. William Thomas - S.I.O.
Mr. Witold L. Klawe - I.A.T.T.A.
Mr. Don Seibert - S.I.O.
Mr. Robert Brennan - S.I.O.
Mr. Charles Worrall - S.I.O.
Mr. Lee Waterman - S.I.O.
Mr. Allan Collmer - S.I.O.
Mr. Robert Born - S.I.O.
Mr. Fred Michel - S.I.O.
Mr. Scot Robertson - U.S.C.G.
Mr. James Cronin - U.S.C.G.
Mr. Paul Woodward - S.I.

S.I.O. - Scripps Institution of Oceanography
I.A.T.T.A. - Inter-American Tuna Commission
U.S.C.G. - United States Coast Guard
S.I. - Smithsonian Institution

APPENDIX B.

Data Collecting Activities

Weather - Recorded by bridge every three hours. Picture of the sky taken every two minutes during the day. Continuous recording of sea temperature, solar radiation and wet bulb, dry bulb difference.
Plankton Tows - Average of eight per day or 2 per station - one surface and one oblique.
Micronekton Tows - Twice a day. Once at night and during the night.
Temperature and Salinity with Depth - Taken on the average of every twenty miles. Some stations only had temperature and depth recorded.
Chemical Nutrients in the Water - Average of four times a day. Recorded at various depths.
Surface Chlorophyll - Continuous recording in addition to detailed analysis twice a day.
Carbon Dioxide - Continuous recording of CO_2 in the air and water.

During the cruise the ship occupied 340 stations which varied from simple recording of temperature with depth to long stations with shallow and deep hydro casts, plankton tows, micronekton tows, and temperature and salinity with depth. Twenty miles was the average spacing of the station, but near the equator the distance was shortened. Two buoys were anchored at sea to continuously record environmental data when ships were not in the area. One was placed at 9°37'N 119°W and the other one at 6°02'N 118°58'W.

The environmental data are now being analyzed in La Jolla, California, and should be available by fall. When it is ready an attempt will be made to correlate the distribution of birds with the ocean environment.

Date 24 Jan 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time — Position: Lat. San Diego, Long. Begin 32°34'N 117°14'W

Sunset: Time 1715 Position: Lat. 32°21'N, Long. 117°17'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 18 Time obs.

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.				
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900						
1000						
1100						
1200						
1300						
1400						
1500	32° 41'N	117°14'W				
1600	32° 32'N	117° 15'W				
1700	32°23'N	117°17'W				
1800	32° 14'N	117° 19'W				
1900						
2000						
2100						
2200						
2300						
2400						

Date 25 Jan 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0644 Position: Lat. 29°27'N. Long. 117°40'W

Sunset: Time 1725 Position: Lat. 28°13'N. Long. 117°38'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 74 (70)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600	28°36					
0700	28°24'	117°42'W				
0800	28°12	117° 38'W				
0900	29° N	117°38'W				
1000						
1100						
1200						
1300						
1400	28° 48'N	117°39'W				
1500	28°36'N	117° 40' W				
1600	28°30'N	117°39'				
1700	28° 18'N	117°38'W				
1800	28°12'N	117°42'W				
1900	28°01'N	117°43'W				
2000	27° 55'N	117° 44'W				
2100	27°43'N	117° 46'W				
2200	27° 37'N	117° 48'W				
2300	27° 24'N	117° 52'W				
2400	27° 17'N	117°54'W				

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Date 26 Jan 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0640 Position: Lat. 26°11'N. Long. 118°15'W

Sunset: Time 1734 Position: Lat. 24°18'N. Long. 118°28'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 113(110)

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.				
2.				
3.				
4.				
5.				

42
60
+1
113

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	27° 06'N	118° W				
0200	26° 59'N	118° W				
0300						
0400	26° 46'N	118° 06'W				
0500						
0600	26° 18'N	118° 13'W				
0700	26° 08'N	118° 16'W				
0800	25° 59'N	118° 19'W				
0900	25° 46'N	118° 19'W				
1000	25° 37'N	118° 19'W				
1100	25° 24'N	118° 19'W				
1200	25° 15'N	118° 19'W				
1300	25° 04'N	118° 21'				
1400	24° 53'N	118° 23'				
1500	24° 42 N	118° 25'				
1600	24° 31'N	118° 27'W				
1700	24° 23'N	118° 28'W				
1800	24° 13'N	118° 30'W				
1900						
2000	23° 53'N	118° 33'W				
2100						
2200	23° 32'N	118° 35'W				
2300						
2400	23° 12'N	118° 35'W				

Date 27 Jan 1967 Ship Argo (31) Cruise No. _____

Organization _____ Recorder _____

Sunrise: Time 0636 Position: Lat. 22°11'N. Long. 118°42'W

Sunset: Time 1741 Position: Lat. 20°50'N. Long. 118°44'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 94 (90)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	23° 06'N	118° 38'W				
0200	23° 54'N	118° 39'W				
0300	22° 50'N	118° 39'W				
0400	22° 37'N	118° 40'W				
0500	22° 30'N	118° 41'W				
0600	22° 18'N	118° 42'W				
0700	22° 10'N	118° 43'W				
0800	21° 58'N	118° 45'W				
0900	21° 48'N	118° 46'W				
1000	21° 36'N	118° 48'W				
1100	21° 26'N	118° 50'W				
1200	21° 16'N	118° 52'W				
1300	21° 04'N	118° 54'W				
1400	21° 04'N	118° 54'W				
1500	20° 59'N	118° 54'W				
1600	20° 51'N	118° 55'W				
1700	20° 50'N	118° 53'W				
1800	20° 50'N	118° 40'W				
1900						
2000						
2100						
2200						
2300						
2400						

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Date 27 Jan 1965 Ship ARGO (IX) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0625 Position: Lat. 21°12'N. Long. 116°44'W

Sunset: Time 1744 Position: Lat. 20°35'N Long. 118°28'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 99(93)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400	21° 7'N	116°44'W				
0500						
0600						
0700						
0800						
0900	↓	↓				
1000	21° 12'N	118° 58'W				
1100	21° 07'N	117° 11'W				
1200	21° 02'N	117° 24'W				
1300	20° 57'N	117° 35'W				
1400	20° 52'N	117° 46'W				
1500	20° 48'N	117° 58'W				
1600	20° 43'N	118° 09'				
1700	20° 38'N	118° 20'W				
1800	20° 33'N	118° 31' W				
1900	20° 28'N	118° 42'W				
2000						
2100						
2200						
2300						
2400						

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Date 29 Jan 1967 Ship ARGO (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0618 Position: Lat. 19°19'N, Long. 119°W

Sunset: Time 1748 Position: Lat. 18°36'N, Long. 119°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 33

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	20°00'N	119°W				
0200	19°56'					
0300	19°46'					
0400	19°34'					
0500	19°21'					
0600	19°19'					
0700	19°19'					
0800	19013'					
0900	19°					
1000	18°48'					
1100	18°36'N	119°W				
1200	↓	↓				
1300						
1400						
1500						
1600						
1700						
1800	↓	↓				
1900	18°23'N					
2000	18°11'N	119°W				
2100	17°58'N	119°W				
2200	17°55'N	119°W				
2300	↓	↓				
2400	↓	↓				

Date 30 Jan 1969 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0629 Position: Lat. 17°10'N, Long. 119°63'W

Sunset: Time 1752 Position: Lat. 15°46'N, Long. 118°56'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 84

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

70

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	17°53'W	119°W				
0200	17°43'N	119°03'				
0300	17°30'W	119°03'				
0400	17°17'N	119°03'W				
0500	17°15'N	119°03'W				
0600	17°15'N	119°03'W				
0700	17°01'N	119°03'W				
0800	16°51'N	119°03'W				
0900	16°37'N	119°03'W				
1000	16°32'N	119°04'W				
1100	↓	119.04				
1200	↓	1190				
1300	16°29'N	119°07W				
1400	16°22'N	119° W				
1500	16°04'	118°58'W				
1600	15°56'	118°57'W				
1700	15°50'N	118°56'W				
1800	15°43'N	118°56'W				
1900	15°33'W	118°54'W				
2000	15°17 N					
2100	15°11'W	118°54'W				
2200	↓	↓				
2300	↓	↓				
2400	↓	↓				

Date 31 Jan 1967 Ship ARGO (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0624 Position: Lat. 14° 36'N, Long. 118°57'W

Sunset: Time 1757 Position: Lat. 13°12'N, Long. 119°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 84 (81)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

36
45

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	15°11'N	118°54'W				
0200	↓	↓				
0300	↓	↓				
0400	15°05'N	118°54'W				
0500	14°53'N	118°57'W				
0600	14°41'N	118°57'W				
0700	14°29	118°57'W				
0800	14°23'W	118°57'W				
0900	14°20'W	118°57'W				
1000	14°09'	118°57'W				
1100	13°57'	118°59'W				
1200	13°50'N	119°				
1300	↓	↓				
1400	↓	↓				
1500	13°46'N	119°W				
1600	13°33'N	119°W				
1700	13°21'N	119°W				
1800	13°12'N	119°W				
1900	13°12'N	119°W				
2000	13°05'N	119°W				
2100	12°55'N	119°W				
2200	12°46'N	119°W				
2300	12°36'	119°W				
2400	↓	↓				

Date 1 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0617 Position: Lat. 12°N, Long. 119°01'W

Sunset: Time 1800 Position: Lat. 10°50'N, Long. 118°57'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 70

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	12°36'N	119°W				
0200	12°34'N	119°W				
0300	12°26 N	119°W				
0400	12°14'W	119°01'W				
0500	12°03'N	119°01'W				
0600	12° N	119°01'W				
0700	11°58'N	119°01'W				
0800	11°47'N	119°01'W				
0900	11°36'W	119°01'W				
1000	11°25'N	119°01'W				
1100	11° | 23°N	|				
1200	|	|				
1300	11°23'N	119°04'W				
1400	11°18 N	119°00°W				
1500	11°07'N	118°57'W				
1600	10°55'N	118°57'W				
1700	10°50'N	118°57'W				
1800	10°50'N	118°57'W				
1900	10°41'N	118°57'W				
2000	10°31'N	118°57'W				
2100	10°20'N	118°55'W				
2200	10°13'N	118°55'W				
2300	|	|				
2400	|	|				

Date 2 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0618 Position: Lat. 9°56'N, Long. 118°52'W

Sunset: Time 1801 Position: Lat. 9°38'N, Long. 119°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 20

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	10°13'N	118°55'W				
0200	|	|				
0300	|	|				
0400	|					
0500	10°08'N	118°52'W				
0600	09°59'N	118°51'W				
0700	09°50'N	118°55'W				
0800	09°42'N	118°58'W				
0900	9°38'N	119°W				
1000	|	|				
1100	|	|				
1200	|	|				
1300	|	|				
1400	|	|				
1500	|	|				
1600	|	|				
1700	|	|				
1800	|	|				
1900	|	|				
2000	09°23'N	119°W				
2100	09°12'N	119°W				
2200	09°59'N	119°W				
2300	08°53'N	119°W				
2400	08°53'N	119°W				

Date 3 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0616 Position: Lat. 8°10'N, Long. 119°W

Sunset: Time 1758 Position: Lat. 6°44'N, Long. 118°56'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 86

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	8°53'N	119°W				
0200	8°48'N	119°W				
0300	8°35'N	119°W				
0400	8°22'N	119°W				
0500	8°10'N	119°W				
0600	8°10'N	119°W				
0700	8°05'N	119°W				
0800	7°53'N	119°W				
0900	7°42'N	119°59'W				
1000	7°31'N	118°58'W				
1100	|	|				
1200	|	|				
1300	7°28'N	118°58'W				
1400	7°17'N	118°58'W				
1500	7°05'N	118°58'W				
1600	7°53'N	118°56'W				
1700	6°50'N	118°56'W				
1800	6°44'N	118°56'W				
1900	6°31'N	118°54'W				
2000	6°19'N	118°53'W				
2100	6°06'N	118°51'W				
2200	6°05'N	118°51'W				
2300	|	|				
2400	|	|				

Date 4 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0614 Position: Lat. 6°05'N, Long. 118°51'W

Sunset: Time 1807 Position: Lat. 5°14'N, Long. 118°52'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 63

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.				
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	6°05'N	118°51'W				
0200						
0300						
0400						
0500						
0600						
0700						
0800	6°05'N	119°01'W				
0900	6°05'N	119°01'W				
1000	6°04'N	119°W				
1100	6°03'N	118°59'W				
1200	6°02'N	118°58'W				
1300	6°01'N	118°58'W				
1400	5°49'N	118°58'W				
1500	5°35'N	118°58'W				
1600	5°27'N	118°58'W				
1700	5°22'N	118°58'W				
1800	5°16'N	118°58'W				
1900	5°04'N	118°56'W				
2000	5°52'N	118°56'W				
2100	4°43'N	118°55'W				
2200	4°43'N	118°55'W				
2300	4°43'N	118°55'W				
2400	4°38'N	118°55'W				

Date 5 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0610 Position: Lat. 3° 44'N, Long. 118°50'W

Sunset: Time 1810 Position: Lat. 2°28'N, Long. 119°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 76(73)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	4°07'N	118°53'W				
0200	4°17'N	118°53'W				
0300	4°04'N	118°51'W				
0400	3°49'N	118°50'W				
0500	3°47'	118°50'W				
0600	3°46'	118°50'W				
0700	3°36'	118°50'W				
0800	3°30'N	119°W				
0900	3°21'N	119°02'W				
1000	3°11'N	119°04'W				
1100	3°05'N	119°04'W				
1200	|	|				
1300	|	|				
1400	3°01'N	119°03'W				
1500	2°57'N	119°				
1600	2°46'N	119°W				
1700	2°40'N	119°W				
1800	2°28'N	119°W				
1900	2°17'N	119°W				
2000	2°25'N	119°W				
2100	2°14'N	119°05'W				
2200	2°08'N	119°07'W				
2300	1°57'N	119°08W				
2400	1°51'N	119°10'W				

Date 6 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0609 Position: Lat. 1°28'N, Long. 119°11'W

Sunset: Time 1814 Position: Lat. 0°23'N, Long. 119°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 67(66)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	1°51'N	119°10'W				
0200	"	"				
0300	"	"				
0400						
0500	1°40'N	119°10'W				
0600	1°29'N	119°11'W				
0700	1°23'N	119°07'W				
0800	1°17'N	119°03'W				
0900	1°08'N	119°02'W				
1000	0°59'N	119°02'W				
1100	0°47'N	119°05'W				
1200	"	"				
1300	"	"				
1400	"	"				
1500	0°43'	119°05'W				
1600	0°38'N	119°01'W				
1700	0°31'N	119°W				
1800	0°25'N	119°W				
1900	0°17'N	119°W				
2000	0°06'N	119°W				
2100	"	"				
2200	"	"				
2300	0°04'N	"				
2400	0°03'S	119°03'W				

1624 58'

1719-50 27.2 119

1845 20.5 119

1945 06'

Date 7 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0606 Position: Lat. 0°43'S, Long. 119°04'W

Sunset: Time 1816 Position: Lat. 1°55'S, Long. 119°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 72(66)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	0°16'S	119°04'W				
0200	0°22'S	119°04'W				
0300	0°32'S	119°04'W				
0400	0°35'S	119°05'W				
0500	0°35'S	119°05'W				
0600	0°42'S	119°05'W				
0700	0°51'S	119°W				
0800	0°57'S	119°W				
0900	1°08'S	119°01'W				
1000	1°14'S	119°02'W				
1100	"	"				
1200	"	"				
1300	1°18'S	119°02'W				
1400	1°28'S	119°W				
1500	1°34'S	119°W				
1600	1°44'S	119°W				
1700	1°54'S	119°W				
1800	1°54'S	119°W				
1900	2°03'S	118°55'W				
2000	2°16'S	119°				
2100	2°23'S	119°W				
2200	2°36'S	119°02'S				
2300	2°38'S	119°02'S				
2400	2°38'S	119°02'S				

Date 8 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0604 Position: Lat. 3° S, Long. 119°04'W

Sunset: Time 1819 Position: Lat. 4°18'S, Long. 118°56'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 78(72)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	2°38'S	119°02'W				
0200	|	|				
0300	|	|				
0400	2°39'S	119°02'W				
0500	2°48'S	119°04'W				
0600	3°00'S	119°04'W				
0700	3°09'S	119°04'W				
0800	3°13'S	119°02'W				
0900	3°16'S	119°02'W				
1000	3°26'S	119°02'W				
1100	3°32'S	119°W				
1200	|	|				
1300						
1400	3°35'S	119°W				
1500	3°44'S	119°01'W				
1600	3°54'S	118°58'W				
1700	4°06'S	118°57'W				
1800	4°18'S	118°56'W				
1900	4°18'S	118°56'W				
2000	4°25'S	118°58'W				
2100	4°36'S	119°W				
2200	4°43'S	119°02'W				
2300	4°54'S	119°W				
2400	4°57'S	119°W				

Date 9 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0601 Position: Lat. 5° 40'S, Long. 118°56'W

Sunset: Time 1821 Position: Lat. 7°02'S, Long. 118°59'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 82(79)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	4°57'S	119°W				
0200	4°58'S	119°W				
0300	5° 07'S	117°W				
0400	5°19'S	119°W				
0500	5°32'S	118°58'W				
0600	5°40'S	118°56'W				
0700	5°40'S	118°56'W				
0800	5° 47'S	118°57'W				
0900	5°59'S	118°59'W				
1000	6° 11'S	118°59'W				
1100	6°21'S	118°58'W				
1200	|	|				
1300	|	|				
1400	6° 24'S	|				
1500	6° 30'S	118°58'W				
1600	6°42'S	118°59'W				
1700	6°55'S	118°59'W				
1800	7° 02'S	118°59'W				
1900	7°02'S	118°59'W				
2000	7 10'S	119°W				
2100	7°22'S	119°W				
2200	7°34'S	118°59'W				
2300	7042'S	118°58'W				
2400	7°42'S	118°58'W				

Date 10 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0558 Position: Lat. 8°05'S, Long. 118°58'W

Sunset: Time 1825 Position: Lat. 9°18'S, Long. 118°57'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 73 (65)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	7°42'S	118°18'W				
0200	|	|				
0300	|	|				
0400	|	|				
0500	7°53'S	|				
0600	8°05'S	118°58'W				
0700	8°15'S	119°W				
0800	8°20'S	119°W				
0900	8°30'S	119°W				
1000	8°31'S	119°W				
1100	8°41'S	119°W				
1200	|	|				
1300	|	|				
1400	|	|				
1500	8°43'S	119°W				
1600	8°51'S	118°55'W				
1700	9°03'S	118°58'W				
1800	9°14'S	118°58'W				
1900	9°18'S	118°57'W				
2000	9°21'S	118°57'W				
2100	9°31'S	119°W				
2200	9°43'S	119°W				
2300	9°54'S	119°W				
2400	9°58'S	119°W				

Date 11 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0555 Position: Lat. 10°38'S, Long. 119°03'W

Sunset: Time 1826 Position: Lat. 11°52'S, Long. 119°03'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 74 (72)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	9°58'S	119°W				
0200	10° S	119°W				
0300	10°09'S	119°W				
0400	10°21'S	119°03'W				
0500	10°33'S	119°02'W				
0600	10°38'S	119°03'W				
0700	10°38'S	119°03'W				
0800	10°51'S	119°02'W				
0900	11°04'S	119°W				
1000	11°17'S	118°56'W				
1100	11°25'S	118°56'W				
1200	|	|				
1300	|	|				
1400	|	|				
1500	|	|				
1600	11°27'S	118°59'W				
1700	11°35'S	119°03'W				
1800	11°47'S	119°03'W				
1900	11°59'S	119°01'W				
2000	12°06'S	119°05'W				
2100	12°10'S	119°11'W				
2200	12°21'S	118°57'W				
2300	12°33'S	118°55'W				
2400	12°44'S	118°54'W				

Date 12 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0554 Position: Lat. 13°20'S, Long. 118°50'W

Sunset: Time 1828 Position: Lat. 14°43'S, Long. 118°57'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 83 (81)

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.				
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	12°48'S	118°51'W				
0200	"	"				
0300	12°50'S					
0400	12°57'S	118°53'W				
0500	13°09'S	118°52'W				
0600	13°21'S	118°50'W				
0700	13°29'S	118°50'W				
0800	13°29'S	118°50'W				
0900	13°38'S	118°55'W				
1000	13°48'S	119°02'W				
1100	14°S	119°W				
1200	14°06'S	119°W				
1300	"	"				
1400	"	"				
1500	14°09'S	119°W				
1600	14°18'S	118°58'W				
1700	14°30'S	118°58'W				
1800	14°41'S	118°57'W				
1900	14°43'S	118°57'W				
2000	14°46'S	118°57'W				
2100	14°58'S	119°W				
2200	15°02'S	119°W				
2300	"	"				
2400	"	"				

Date 13 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0551 Position: Lat. 15°36'S, Long. 119°06'W

Sunset: Time 1831 Position: Lat. 17°04'S, Long. 118°58'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 88 ~~85~~ (83)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	15°02'S	119°01'W				
0200	15°02'S	119°01'W				
0300	15°05'S	119°01'W				
0400	15°14'S	119°01'W				
0500	15°26'S	119°06'W				
0600	15°38'S	119°06'W				
0700	15°41'S	119°06'W				
0800	15°44'S	119°06'W				
0900	15°54'S	119°02'W				
1000	16°05'S	118°58'W				
1100	16°18'S	119°W				
1200	16°26'S	119°W				
1300	16°26'S	119°W				
1400	16°26'S	119°W				
1500	16°35'S	119°W				
1600	16°46'S	119°W				
1700	16°57'S	118°59'W				
1800	17°04'S	118°58'W				
1900	17°04'S	118°58'W				
2000	17°16'S	119°W				
2100	17°27'S	119°W				
2200	17°39'S	119°W				
2300	17°45'S	119°W				
2400	17°45'S	119°W				

Date 14 Feb 1969 Ship ARGO (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0549 Position: Lat. 18°27'S, Long. 119°04'W

Sunset: Time 1834 Position: Lat. 19°40'S, Long. 119°03'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 73 (70)

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.				
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	17°45'S	119°W				
0200	17°50'S	119°W				
0300	18°03'S	119°03'W				
0400	18°15'S	119°04'W				
0500	18°27'S	119°04'W				
0600	18°27'S	119°04'W				
0700	18°35'S	119°02'W				
0800	18°48'S	119°W				
0900	19°S	119°02'W				
1000	19°08'S	119°02'W				
1100	↓	↓				
1200						
1300						
1400						
1500	↓	↓				
1600	19°11'S	119°02'W				
1700	19°21'S	119°03'W				
1800	19°33'S	119°03'W				
1900	19°45'S	119°03'W				
2000	20°S	119°W				
2100	↓	↓				
2200						
2300						
2400	↓	↓				

Date 15 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0551 Position: Lat. 20°03'S, Long. 119°52'W

Sunset: Time 1842 Position: Lat. 19°57'S, Long. 121°37'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 107 (105)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	20°S	119°W				
0200	20°S	119°10'W				
0300	20°S	119°22'W				
0400	20°02'S	119°36'W				
0500	20°02'S	119°48'W				
0600	20°03'S	119°52'W				
0700	20°03'S	119°54'W				
0800	20°S	120°07'W				
0900	20°S	120°22'W				
1000	20°S	120°35'W				
1100	20°S	120°43'W				
1200	/	/				
1300						
1400	20°S	120°47'W				
1500	19°59'S	121°				
1600	19°58'S	121°14'W				
1700	19°58'S	121°28'W				
1800	19°57'S	121°37'W				
1900	19°57'S	121°37'W				
2000	19°58'S	121°50'W				
2100	19°58'S	122°04'W				
2200	20°S	122°16'W				
2300	20°S	122°28'W				
2400	20°S	122°28'W				

Date 16 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0605 Position: Lat. 20°03'S, Long. 122°12'W

Sunset: Time 1856 Position: Lat. 19°59'S, Long. 125°09'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 100(98)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	20°S	122°23'W				
0200	20°S	122°34'W				
0300	20°S	122°44'W				
0400	20°01'S	122°57'W				
0500	20°04'S	122° 10'W				
0600	20°02'S	1230 23'W				
0700	20°02'S	123° 23'W				
0800	20°02'S	123° 29'W				
0900	20°S	123°42'W				
1000	20°S	123° 55'W				
1100	20°S	124° 09'W				
1200	20°S	124°12'W				
1300	|	|				
1400	|	|				
1500	20°S	124018'W				
1600	20°S	124° 32'W				
1700	20°S	1240 45'W				
1800	20°S	125°W				
1900	19°59'S	125°09'W				
2000	19°59'S	125°09'W				
2100	19°59'S	125°21'W				
2200	19°59'S	125°34'W				
2300	19°59'S	125° 46'W				
2400	19°59'S	125° 59'W				

Date 17 Feb 1969 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0617 Position: Lat. 19°17'S, Long. 125°56'W

Sunset: Time 1854 Position: Lat. 17°45'S, Long. 126°W

1/27
15
2

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 82

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	19°54'S	125°56'W				
0200	19°59'S	125°59'W				
0300	19°54'S	125°59'W				
0400	19°41'S	125°58'W				
0500	19°28'S	125°56'W				
0600	19°17'S	125°56'W				
0700	19°17'S	125°56'W				
0800	19°08'S	125°58'W				
0900	18°55'S	125°59'W				
1000	18°42'S	126°01'W				
1100	18°36'S	126°02'W				
1200	↓	↓				
1300	↓	↓				
1400	18°28'S	126°02'W				
1500	18°15'S	126°02'W				
1600	18°02'S	126°W				
1700	17°52'S	126°W				
1800	17°52'S	126°W				
1900	17°44'S	126°W				
2000	17°31'S	125°59'W				
2100	17°19'S	126°02'W				
2200	17°06'S	126°02'W				
2300	17°05'S	126°02'W				
2400	17°05'S	126°02'W				

Date 18 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0620 Position: Lat. 16°34'S, Long. 126°03'W

Sunset: Time 1853 Position: Lat. 14°57'S, Long. 126°W

Miles travelled from 0000 hours to sunrise = _____ 34

Miles travelled from sunrise to sunset = 97(93) 63

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	17°06'S	126°02'W				
0200	"	"				
0300	"	"				
0400	17°00'S	126°02'W				
0500	16°51'S	126°02'W				
0600	16°38'S	126°02'W				
0700	16°25'S	126°02'W				
0800	16°18'S	126°02'W				
0900	16°14'S	126°02'W				
1000	16°02'S	126°02'W				
1100	15°50'S	126°02'W				
1200	15°42'S	126°02'W				
1300	↓	↓				
1400	↓	↓				
1500	15°35'S	126°02'W				
1600	15°22'S	126°02'W				
1700	15°10'S	126°02'W				
1800	14°57'S	126°W				
1900	14°57'S	126°W				
2000	14°50'S	126°W				
2100	14°37'S	126°W				
2200	14°24'S	126°W				
2300	14°14'S	126°W				
2400	14°14'S	126°W				

Date 19 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0622 Position: Lat. 13°24'S, Long. 126°W

Sunset: Time 1951 Position: Lat. 11°48'S, Long. 126°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 96

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	14°14'S	126°W				
0200	14°04'S	126°W				
0300	13°51'S	126°02'W				
0400	13°37'S	126°01'W				
0500	13°24'S	126°W				
0600	13°24'S	126°W				
0700	13°19'S	126°W				
0800	13°06'S	126°01'W				
0900	12°53'S	126°01'W				
1000	12°42'S	126°01'W				
1100	"	"				
1200	"	"				
1300	12°41'S	126°01'W				
1400	12°31'S	126°02'W				
1500	12°18'S	126°02'W				
1600	12°05'S	126°02'W				
1700	11°57'S	126°W				
1800	11°57'S	126°W				
1900	11°46'S	126°W				
2000	11°34'S	126°W				
2100	11°20'S	126°W				
2200	11°14'S	126°01'W				
2300	11°14'S	126°01'W				
2400	11°14'S	126°01'W				

Date 20 Feb 1967 Ship Argo (31) Cruise No. ____

Organization ____ Recorder ____

Sunrise: Time 0630 Position: Lat. 10°26'S, Long. 126°W

Sunset: Time 1818 Position: Lat. 08°52'S, Long. 126°W

Miles travelled from 0000 hours to sunrise = ____

Miles travelled from sunrise to sunset = 94

Miles travelled from sunset to 2400 hours = ____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.				
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	11°14'S	126°01'W				
0200	11°14'S	126°01'W				
0300	11°06'S	126°01'W				
0400	10°58'S	126°01'W				
0500	10° 39'S	126°W				
0600	10° 26'S	126°W				
0700	10° 26'S	126°W				
0800	10°19'S	126°W				
0900	10° 05'S	126°01'W				
1000	9° 52'S	126°03'W				
1100	9°41'S	126°03'W				
1200	"	"				
1300	"	"				
1400	9° 26'S	126°03'W				
1500	9°23'S	126°01'W				
1600	9° 10'S	126°01'W				
1700	8° 58'S	126°W				
1800	8°58'S	126°W				
1900	8° 50'S	126°W				
2000	8° 37'S	126°W				
2100	8° 23'S	126°W				
2200	8°15'S	126°W				
2300	"	"				
2400	"	"				

Date 21 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0628 Position: Lat. 7°27'S, Long. 126°02'W

Sunset: Time 1837 Position: Lat. 5°41½, Long. 126°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 106

Miles travelled from sunset to 2400 hours = _____

T9
27

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	8°13'S	126°W				
0200	8°02'S	126°W				
0300	7°49'S	126°01'W				
0400	7°35'S	126°01'W				
0500	7°27'S	126°02'W				
0600	7°27'S	126°02'W				
0700	7°20'S	126°02'W				
0800	7°06'S	126°02'W				
0900	6°52'S	126°03'W				
1000	6°38'S	126°04'W				
1100	"	"				
1200	"	"				
1300	6°34'S	126°04'W				
1400	6°25'S	126°03'W				
1500	6°12'S	126°03'W				
1600	5°59'S	126°W				
1700	5°53'S	126°W				
1800	5°50'S	126°W				
1900	5°36'S	126°W				
2000	5°22'S	126°W				
2100	5°09'S	126°W				
2200	"	"				
2300	"	"				
2400	"					

Date 22 Feb. 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0631 Position: Lat. 4°26'S, Long. 126°W

Sunset: Time 1843 Position: Lat. 2°58'S, Long. 126°05'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 88 (86)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	5°09'S	126°W				
0200	5°04'S	126°W				
0300	5°01'S	126°W				
0400	4°47'S	126°02'W				
0500	4°39'S	126°02'W				
0600	4°26'S	126°W				
0700	4°26'S	126°W				
0800	4°19'S	126°W				
0900	4°04'S	126°W				
1000	3°58'S	126°01'W				
1100	3°45'S	126°01'W				
1200	3°41'S	126°03'W				
1300	3°41'S	126°03'W				
1400	3°37'S	126°03'W				
1500	3°28'S	126°03'W				
1600	3°19'S	126°05'W				
1700	3°12'S	126°05'W				
1800	3°5	126°05'W				
1900	2°58'S	126°05'W				
2000	2°51'S	126°03'W				
2100	2°34'S	126°W				
2200	2°34'S	126°W				
2300	2°24'S	126°03'W				
2400	2°15'S	126°03'W				

Date 23 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0633 Position: Lat. 1°32'S, Long. 126°07'W

Sunset: Time 1845 Position: Lat. 0°08'S, Long. 126°03'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 84 (82) 52

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	2° 15'S	126°03'W				
0200	2° 14'S	126°03'W				
0300	2° 07'	126°01'				
0400	1° 54'S	126°04'W				
0500	1° 49'S	126°03'W				
0600	1° 32'S	126°06'W				
0700	1° 32'S	126°07'W				
0800	1° 28'S	126°07'W				
0900	1° 16'S	126°06'W				
1000	1° 08'S	126°04'W				
1100	0° 54'S	126°04'W				
1200	0° 45'S	126°02'W				
1300	/	/				
1400	/	/				
1500						
1600	0° 38'S	126°05'W				
1700	0° 24'S	126°04'W				
1800	0° 17'S	126°03'W				
1900	0° 05'S	126°03'W				
2000	0° 2'N	126°02'W				
2100	0° 21'N	126°02'W				
2200	0° 13'N	126°03'W				
2300	0° 22'N	126°03'W				
2400	0° 35'N	126°03'W				

017° 13 Kts

008°

Date 24 Feb 1969 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0635 Position: Lat. 1°22'N, Long. 126°02'W

Sunset: Time 1839 Position: Lat. 2°45'N, Long. 126°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 83

Miles travelled from sunset to 2400 hours = _____

38
45
3

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	0°41'N	126°02'W				
0200	"	"				
0300	"	"				
0400	0°50'N	126°04'W				
0500	1°03'N	126°04'W				
0600	1°13'N	126°03'W				
0700	1°23'N	126°02'W				
0800	1°23'N	126°02'W				
0900	1°37'N	126°02'W				
1000	1°45'N	126°00'W				
1100	1°58'N	126°W				
1200	2°05'N	126°W				
1300	2°05'N	126°W				
1400	2°01'N	126°W				
1500	2°18'N	126°01'W				
1600	2°26'N	126°01'W				
1700	2°39'N	126°W				
1800	2°45'N	126°W				
1900	2°50'N	126°W				
2000	3°03'N	126°W				
2100	3°11'N	126°W				
2200	3°24'N	126°W				
2300	"	"				
2400	"	"				

0.07°

000°/025

360°

Date 25 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0610 Position: Lat. 3°56'N, Long. 126°W

Sunset: Time 1841 Position: Lat. 5°23'N Long. 125°59'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 87

Miles travelled from sunset to 2400 hours = _____

64
23

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.				
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	3°25'N	126°W				
0200	"	"				
0300	"	"				
0400	3°27'N	126°W				
0500	3°37'N	126°W				
0600	3°46'N	126°W				
0700	4°'N	126°W				
0800	4°06'N	126°W				
0900	4°08'N	126°W				
1000	4°21'N	126°W				
1100	4°29'N	126°W				
1200	4°36'N	126°W				
1300	"	"				
1400	"	"				
1500	4°46'N	126°W				
1600	4°49'N	126°W				
1700	5°01'N	126°W				
1800	5°14'N	125°59'W				
1900	5°22'N	125°59'W				
2000	5°22'N	125°59'W				
2100	5°35'N	125°59'W				
2200	5°47'N	126°W				
2300	6°N	126°W				
2400	6°10'N	126°W				

Date 26 Feb 1967 Ship Hugo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0642 Position: Lat. 6°57'N, Long. 125°56'W

Sunset: Time 1835 Position: Lat. 5°37'N, Long. 124°01'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 90 (88)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	6°16'N	125°58'W				
0200	6°1-N	125°59'W				
0300	6°13'N	125°59'W				
0400	6°11'N	125°59'W				
0500	6°9'N	125°59'W				
0600	6°5'N	125°59'W				
0700	6°5'N	125°58'W				
0800	6°5'N	125°58'W				
0900	7°0'N	125°58'W				
1000	7°2'N	126°W				
1100	7°3'N	126°W				
1200	7°4'N	126°W				
1300	〃	〃				
1400	〃	〃				
1500	7°4'N	126°01'W				
1600	7°6'N	126°03'W				
1700	7°7'N	126°04'W				
1800	7°7'N	126°04'W				
1900	7°7'N	126°04'W				
2000	7°5'N	126°04'W				
2100	7°4'N	126°03'W				
2200	7°0'N	126°01'W				
2300	6°6'N	126°W				
2400	6°1'N	126°W				

Date 29 Feb 1967 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0639 Position: Lat. 9°40'N Long. 126°02'W

Sunset: Time 1833 Position: Lat. 11°15'N Long. 125°59'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 95(93)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900						
1000						
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

Date 28 Feb 1967 Ship Hugo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0640 Position: Lat. 13° 50'N, Long. 126°03'W

Sunset: Time 1832 Position: Lat. 14°13'N, Long. 126°W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 83 (81)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	12°50'N	126°W				
0200	12°54'N					
0300	13°10'N					
0400	13°24'N	126°03'W				
0500	13°37'N					
0600	13°50'N	126°03'W				
0700	13°50'N	126°03'W				
0800	13°50'N	126°03'W				
0900	13°50'N	126°00'W				
1000	13°52'N	126°W				
1100	13°52'	126°00'W				
1200	/	/				
1300	/	/				
1400	/	/				
1500						
1600	13°50'N	126°				
1700	13°51'N	126°W				
1800	14°00'N	126°W				
1900	14° 13' N	126°W				
2000	14° 13' N	126° W				
2100	14° 21'N	126°W				
2200	14°34'N	126°W				
2300	14°46'N	126°W				
2400	14°58'N	126°W				

Date 1 March 1967 Ship Argo (31) Cruise No. ____

Organization ____ Recorder ____

Sunrise: Time 0642 Position: Lat. 15°17'N Long. 126°W

Sunset: Time 1831 Position: Lat. 16°[illegible]N, Long. 126°[illegible]W

Miles travelled from 0000 hours to sunrise = ____

Miles travelled from sunrise to sunset = 97 (95)

Miles travelled from sunset to 2400 hours = ____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	14-40'N	13[illegible]W				
0200						
0300						
0400						
0500	14°56'N	13[illegible]W				
0600	15°04'N	13[illegible]W				
0700	15°21'N	13[illegible]W				
0800	15°33'N	13[illegible]W				
0900	15°[illegible]N	13[illegible]W				
1000	15°43'N	126°W				
1100	15°56'N	126°W				
1200	16°06'N	126°W				
1300						
1400						
1500	16°13'N	126°W				
1600	16°[illegible]N	126°W				
1700	16°31'N	126°W				
1800	16°53'N	126°W				
1900	16°[illegible]N	126°W				
2000	16°54'N	126°W				
2100	16°09'N	126°W				
2200	17°01'N	126°W				
2300	17°35'N	126°W				
2400	17°[illegible]N	126°W				

Date 2 Mar 1966 Ship Argo (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0643 Position: Lat. 18°35'N, Long. 126°W

Sunset: Time 1829 Position: Lat. 20° N, Long. 123°30'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 84

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	17°11'N	126°W				
0200	17°47'N	126°W				
0300	17°59'N	126°W				
0400	18°10'N	126°W				
0500	18°23'N	126°W				
0600	18°36'N	126°W				
0700	18°40'N	126°W				
0800	18°48'N	126°W				
0900	19°02'N	126°02'W				
1000	19°16'N	126°03'W				
1100	19°29'N	126°04'W				
1200	"	"				
1300	"	"				
1400	19°30'N	126°02'W				
1500	19°40'N	126°02'W				
1600	19°54'N	126°W				
1700	20°N	125°58'W				
1800	"	"				
1900	"	"				
2000	"	"				
2100	"	"				
2200						
2300						
2400						

Date 3 March 1967 Ship Argo (31) Cruise No. _____

Organization _____ Recorder _____

Sunrise: Time 0637 Position: Lat. 21°40'N Long. 125°40'W

Sunset: Time 1812 Position: Lat. 22°55'N, Long. 124°41'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 93(91)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300	21°N	125°45'W				
0400						
0500	21°20'N	125°40'W				
0600	21 33'N	125°44'W				
0700	21°44'N	125°38'				
0800	21°58'N	125°30'W				
0900	22°07'N	125°28'W				
1000	22° 16'N	125° 27'N				
1100	22° 30'N	125° 24'N				
1200	22° 33'N	125° 20'W				
1300	↓	↓				
1400	↓	↓				
1500	↓	↓				
1600	22° 41'N	125° 11'W				
1700	22° 46'N	125° 5'W				
1800	22° 53'N	124° 45'W				
1900	23° 00'N	124° 32'W				
2000	23° 6'N	124° 19'W				
2100	23° 13'N	124° 06'W				
2200	↓	↓				
2300	↓	↓				
2400	↓	↓				

Date 4 March 1967 Ship ARGO (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0633 Position: Lat. 23° 51'N, Long. 122° 56' W

Sunset: Time 1809 Position: Lat. 24° 33'N, Long. 121° 35' W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 92

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.				
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600	23° 47'N	123° 62'W				
0700	23° 54'N	122° 50'W				
0800	|	|				
0900	|	|				
1000	|	|				
1100	23° 55'N	122° 48'W				
1200	24° 01.5N	122° 36'W				
1300	24° 08 N	122° 24'W				
1400	24° 14.5'N	122° 12' W				
1500	24° 21'N	121° W				
1600	24° 27.5	121° 48'W				
1700	24° 33'N	121° 34'W				
1800	|	|				
1900	|	|				
2000	|	|				
2100						
2200						
2300						
2400						

Date 5 March 1967 Ship AGOR (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0622 Position: Lat. 26°33'N, Long. 120°46'W

Sunset: Time 1800 Position: Lat. 28°55'N, Long. 119°25'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = 160(101)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600	26°29'N	120°48'W				
0700	26°41'	120°41'W				
0800	26°53'N	120°34'W				
0900	27°05'N	120°27'W				
1000	27°17'N	120°20'W				
1100	27°29'N	120°13'W				
1200	27°41'N	120°06'W				
1300	27°53'N	119°59'W				
1400	28°06'N	119°52'W				
1500	28°18'N	119°46'W				
1600	28°31'N	119°39'W				
1700	28°43'N	119°32'W				
1800	28°55'N	119°25'W				
1900						
2000						
2100						
2200						
2300						
2400						

Date 6 March 1967 Ship ARGO (31) Cruise No. 1

Organization _____ Recorder _____

Sunrise: Time 0615 Position: Lat. 31°15'N, Long. 118°07'W

Sunset: Time San Diego Position: Lat. —, Long. —

Miles travelled from 0000 hours to sunrise = _____

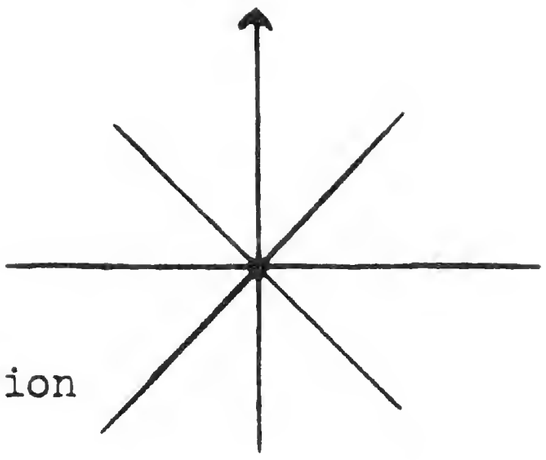
Miles travelled from sunrise to sunset = 83(70)

Miles travelled from sunset to 2400 hours = _____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600	31° 12'N	118° 09'				
0700	31° 23'N	117° 02'				
0800	31° 35'N	117° 55'				
0900	31° 42'N	117° 52'				
1000	31° 53'N	117° 45'				
1100	32° 05'N	117° 37'				
1200	32° 16'N	117° 30'W				
1300	32° 27 N	117° 23'W				
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						



Ship Direction

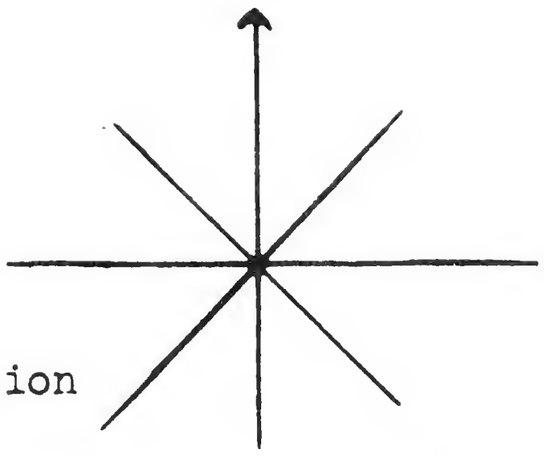
OBSERVERS: Woodward

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

SPECIMEN Nocturnal
or

Date 31 Jan 1967
Pg.# 1

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
1830					Start
1930					Leave on station
2300					Begin
2345	Tropicbird	1	⊖		
2400					Leave on station.



Ship
Direction

OBSERVERS:

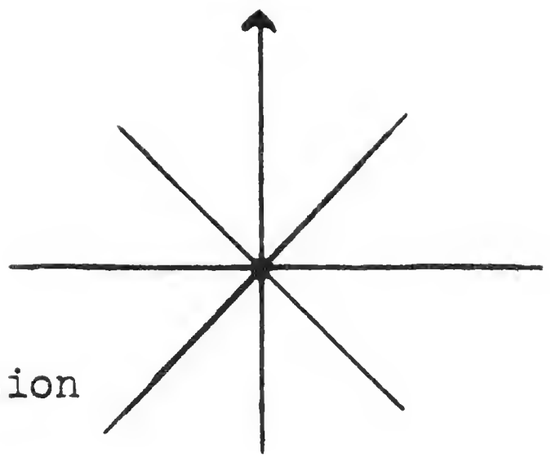
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 1 Feb 1967
Pg.# 1

Nocturnal

On station

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
2130					Begin
2245	Bird	1	0		
2300					Cease



Ship Direction

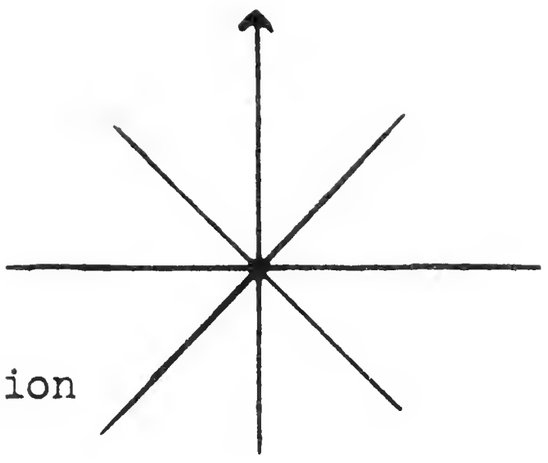
OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 3 Feb 1967
Pg.# 1

SPECIMEN Nocturnal
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
2100					On station
2130	Soot, Tern	1			Begin
2245	Leach's Type	1	O		In mist-calling
2400					Cease
0145					Begin
0145	Leach's SP	1			Nite. Leach's SP flew aboard ship at 0145 and was captured. collected.
0210	Leach's Type	1	O		
0230					Cease



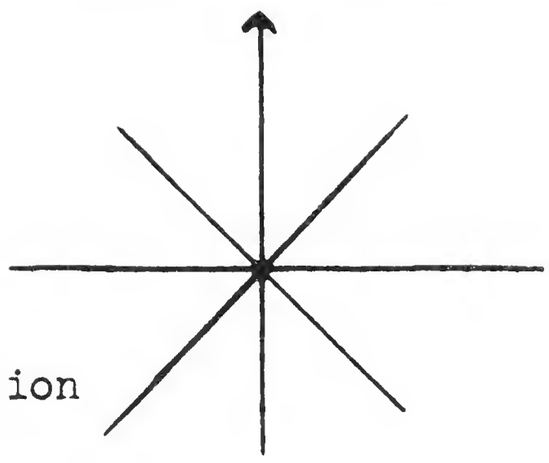
Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 4 Feb 1967
Pg.# 1

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
2100					Begin Orientation
2102	Leach's SP	1			Flew aboard - collected
2130	Leach's Type	1	♀		
2215	Sooty Tern	3	♀		1 adult 2 immatures
2230					⊗ Cane



Ship
Direction

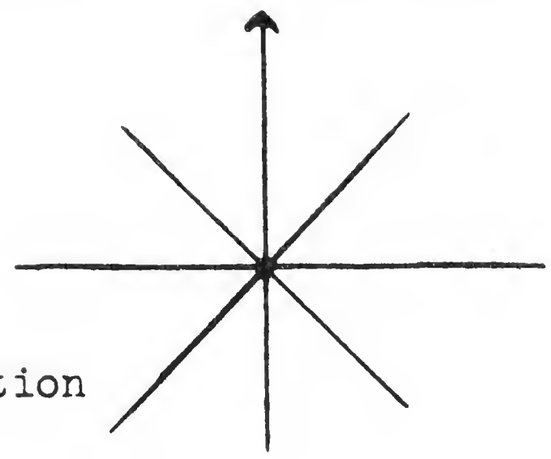
OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 7 Feb 1967
Pg.# 1

Nocturnal

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
2200					On Station Begin
2400					End



Ship
Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 9-10 Feb

Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
2230					Begin On station
2255	Shear. Pet	1	o		
0030					Cease.

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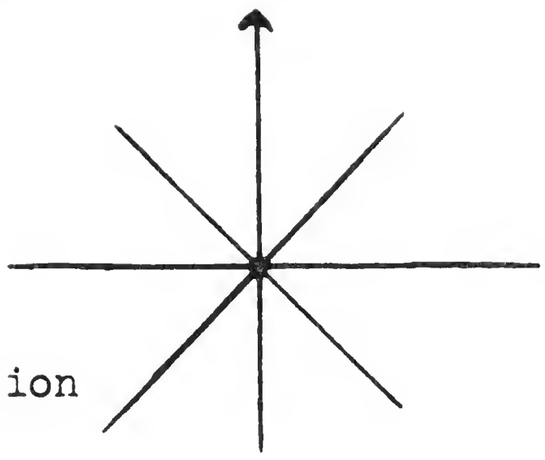
Rev. 5-66



Ship
Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 14 Feb 1967
Pg.# 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
2000					Begin on Station.
2100					End

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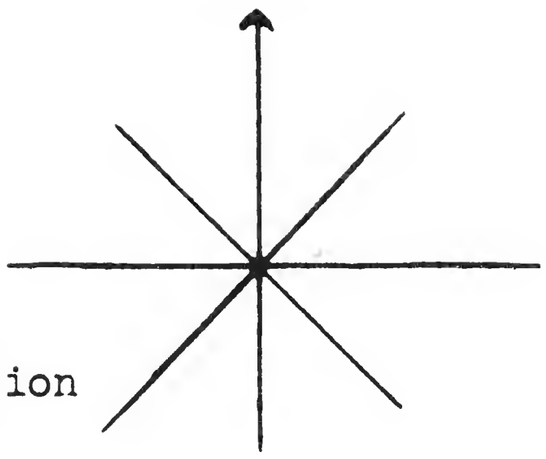
Rev. 5-66



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 18 Feb ~~66~~ 1967
Pg. # 1

TIME	SPECIES	SPECIMEN #	DIR.	BAND NO.	REMARKS
2255					Begin Orientation
2340					End "

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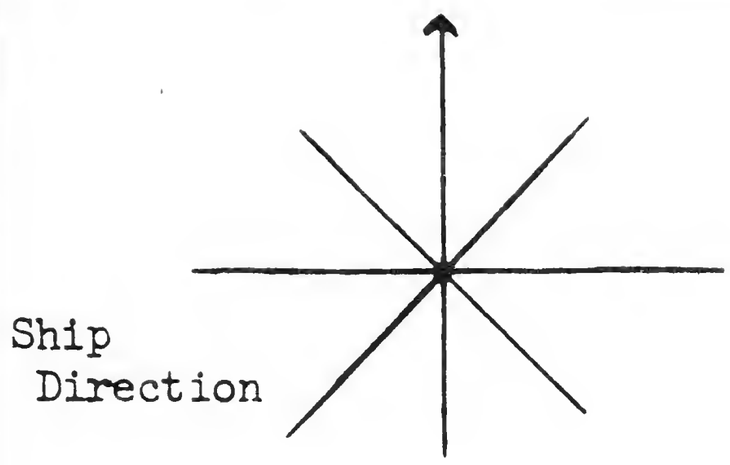
Rev. 5-66



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 27-28 Feb
Pg.# 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
2330					Bojun
2345	Wedgetail	1	a		Light
2346	Sooty Tern	1	a		Immature calling
0015					Gone.

SI-MNH-958e
7-28-64

SW

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

Argo

DATE 24 Jan 1967
Pg.# 1

	time	species	#	dir.	hgt.	remarks	loc.
	1515					Begin Obs.	
	1515	Manx Shear	2	W			
	1520	Br. Pelican	3			on H_2O	
	1520	Heermann's Gull	3	W		adults	
FF	1525	Gulls sp	20	E2		Distant mob. feeding	
	1526	Br Pelican	1				
	1530	West. Gull	2			on H_2O	
		Ring-billed	1				
		California	1			adults following ship.	
	1532	Royal Tern	1	W			
	1533	Phalarope	2				
	1535	Heermann's Gull	1			imm	
	1536	Cormorant	1			on H_2O	
	1540	Cormorant	4				
TF	1541	Br. Pelican	6	W		on H_2O	
	1541	Br Pelican	3	W			
	1545					[redacted] Rain - light	
	1548	Arctic Loon	1	E			
TF	1552	Br. Pelican	17	W			
	1555	Br Pelican	2	SW			
	1555	Cormorant	1	W			
	1555	Heermann's Gull	2	W		adults	
	1559	Cassin's Auklet	1			on H_2O	
	1559	West Gull	1			adult on H_2O	
	1600	Cormorant	3	W			
	1600					Rain-stop	
	1603	Cassin Auk	1				
	1604	Cassin Auk.	1			on H_2O	
F	1615	Surf Scoter	7			on H_2O	
F	1618	Surf Scoter	50±5			on H_2O 20? net?	
	1620	Br Pelican	4	W		on H_2O.	
	1630	Br Pelican	2	∞			
TF	1640	Larus	8	W			

Manx 2
Br Peli - 25
Hrm - 6
Imm - 28
West - 3
Ring - 1
Cal - 1
Royal - 1
Ph. - 2
Comm 7
Arctic - 1
Cassin 3
Surf Scoter 57
112

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7-28-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

Argo
DATE 24 Jan 1967
Pg.# 2

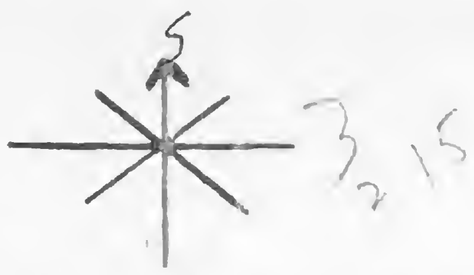
time	species	#	dir.	hgt.	remarks	loc.
1645	West Gull	1	N		adult	
1652	Bl-b, Kit	1	N		imm	
1655	Larus	4	NW			
1656	Larus	3	NW			
1700					Crane Observation	
1715					Sunset.	

Bl-kitt - 1
West - 1
Gull - 7

SI-MNH-958e
7-28-64

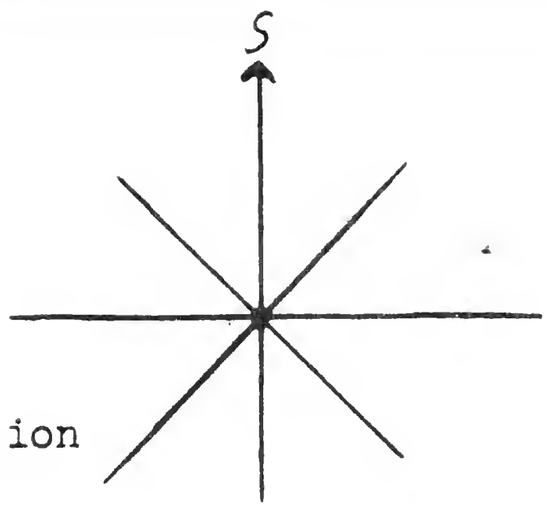
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

DATE 25 Jan 1967
Pg. # 1



time	species	#	dir.	hgt.	remarks	loc.
					BFA	
0644					Sunrise	
0645	B-f Alba	1			Following ship	1
~~0647~~					07-1 07-100% clear	
0726	Calif Gull	1			08-2 rain on	2
0755	BFAlba	1			09-1 horizon	
					10-0 08-90%	
					Following ship 11-0 clearing	
					12-0 no rain	
0900					Total of 2 13-1 09-20%	
					14-0 sunny	
1100					Stop for Station. 1 BFA +	
1200					Still on station. ICG still following	
					Break. 10-15 10% cloudy & sunny	
1225	Herring Gull	1			Resume. 16-20% cloudy	
					3rd year bird almost adult - attracted	
					to ship. Leg color seen.	
1305					Off station - Underway again.	
1355						
1410	Larus ~~sp~~ atricilla	1			Flying Fish.	
1420	Leach's Type	1			~~[redacted]~~. following ship. Flesh-colored	
1426	Leach's Type	1			legs light eye. 2nd year.	
1443	Leach's Sp	1			Black dividing line seen.	
1445					Stop for station.	
1530					Underway	
1600	Leach's Type	1				
1601						
↓					Break for Drills.	
1620						
1620					2 BFA alba following.	
1623	Manx Shear	1		W		
1631	Herring? Gull	2			Immature - Following ship for 15 min	
1650	Leach's Type	1				
1653	Storm Pet	1		W	Leach - 1 BFA - 2	
1655	Storm Pet	2		NW	Leach Type 5 Calif Gull - 1	
1705	Leach's Type	1		W	Storm 4 Herring 2	
1705	Stan Pelid	1			Manx 1 Herring? 2	
1725					Sunset	

18



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 26 Jan 1967
Pg.# 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0640					Sunrise
0700	B-F Alba	2	o		all dark following ship
0710	Leach's Type	1	W		Note: all BFA are subadults - dark rump.
0728	Leach's Type	1	W		
0748	Leach's Type	1	Q		
0750					STop
0820					Underway again.
0845	Leach's Type	1	O		
0850	Storm Pet	1	W		
0852	Leach's SP	2	O		Bl line seen.
0900	Storm Pet	1	O		
0920	BF Alba	1			Total of 3 following ship - all dark
0925	Leach's SP	1	W		Bl divider seen.
0935	Leach's Type	2	O		
0938	Leach's Type	2	O		
0956					STop.
1001	BF Alba	1	o		Total of 4
1025					Underway.
1130	1145				BREAK
1150	jaeger sp	1	N		
1200					
1225					Stop
1319	Leach's Type	2	O		Underway again
ADP					
1405					STop.
1410					Underway.
1448	Leach's Type	1	O		
1448	Mpet - Shea	1	o		
1500	Leach's Type	1	O		
1500	Bird	1	E		
1544	Leach's Type	1	E		
1548					STop
1600	Leach's Type	1	O		
1613	Storm Pet	1	O		
1614					Underway
1620	Leach's Type	1	O		
1700	BF Alba	2			Total of 6 following ship

BFA 7-2, 8-2, 9-1, 10-3, 11-4, 12-4, 13-1, 14-1, 15-2, 16-4, 17-6

BFA - 6
Bird - 3
Leach's Type - 15
Storm Pet - 3
Jaeger sp - 1
Bird - 1
Shea Pet - 1

28.26

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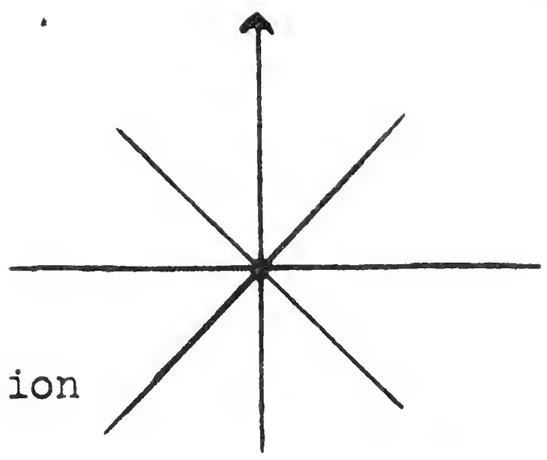

Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 26 Jan 1967
Pg.# 2

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
1708	Storm Pet	1	O		
1708	Bird	1	O		
1712	Shear-Pet	1	W		
1722	Shear-Pet	1	E		
1722					Shark
1736					Sunset

Storm-1
Bird-1
S-P-1

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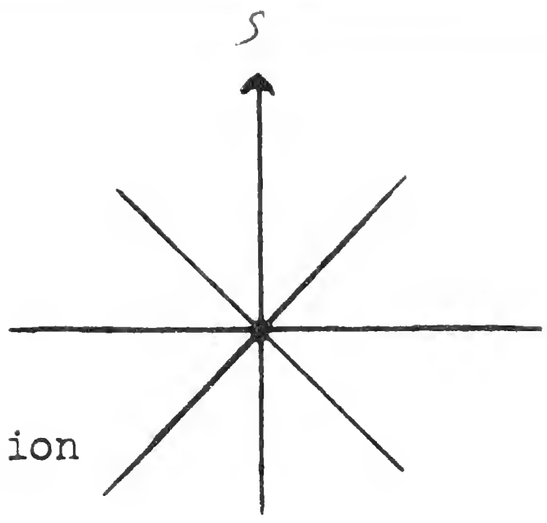

Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 27 Jan 1967

Pg.# 1

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0636					Sunrise
0645	BF alba	2			following ship (en station / dark-rumped
0700					Underway
0750	Sharn-Pet	1	W		
0820	Leach's Type	1	⊙		
0832	STormPet	1	⊙		
0838	Leach's Type	1	⊙		
0842					Stop.
0854	StormPet	1	⊙		
0857	BF Alba	1			Total of 3 are banded on right leg others not banded.
0906					Underway.
0922	BF Alba	1			Total of 4 Dark-rumped.
1019	Leach's Type	1	⊙		
1021	Leach's sp	3	●		
1035	STormPet	1	W		Black dividers seen. Feeding - Flew low to H_2O - landed in it - picked up food with bill and then took off.
1047					STop.
1110					underway.
1130	SO				
[redacted]					Break.
1250					STop
1300	R-bill. Tropic	C 1	⊙		adult.
1330	Leach's Type	1	⊙		
1337	StormPet	1	⊙		
1346	[redacted]				Underway.
1356	Leach's Type	1	⊙		
1426					Underway
1436	Manx Shear	1	⊗		
1443	STormPet.	1	⊙		
1500	Leach's Type	1	⊙		
1525	Leach's Type	1	⊙		
1533	Leach's Type	1	⊙		
1552	STormPet.	1	⊙		
1615					STop.
1618	STormPet	1	⊙		
1625	StormPet	1	⊙		
1641	Leach's Type	1	⊙		
1649					Underway.
1711	Leach's SP	1	⊙		Bl dividers seen.
1741					Sunset

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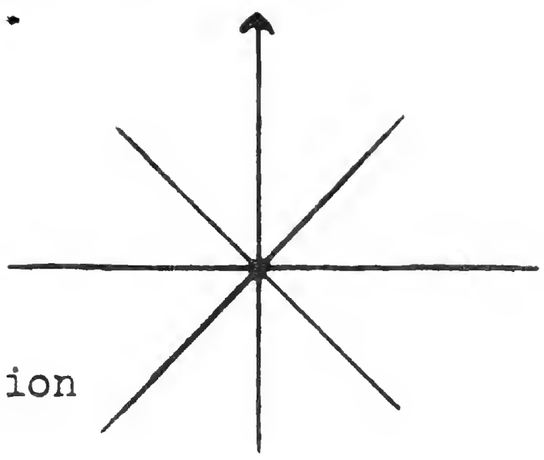

Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 28 Jan 1967
Pg.# 1

	TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
	0625					Sunrise Ship was diverted off course
	0740	B-F Alba	1	⊖		not to [redacted] meet other ship which
	0740	Storm Pet	1	⊖		following needed a [redacted] docta. We are now
						by that ship. Stop in H_2O.
	0755					Whale-1 - about 8' long (3-4' from mout To dorsal fin)
						small d.f. pointed - Black - slowly surfacing.
	0855					Pilot Whale?
	0906	Leach's Type	1	⊖		Underway Heading 250°
	0930	Storm Pet	1	⊖		
	0935	Leach's Type	2			on H_2O
	0950	Leach's Type	2	⊖		
	1000	Leach's Type	1	⊖		
	1012	Leach's Type	1	⊖		
	1027	Leach's Type	1	⊖		
	1030	Leach's Type	2			on H_2O
FF	1038	Leach's Type	10	⊖		feeding.
	1040	Leach's Type	3			
	1042	Jaeger sp	1			on H_2O
FF	1045	Leach's Type	13			on H_2O
	1045	Phalarope	4			Some feeding.
	1050	Leach's Type	4			on H_2O
	1052	Leach's SP	1	⊖		
F	1100	Leach's type	8			Bl line rear on rump
	1120	Storm Pet	1			on H_2O
	1128	Leach's Type	1	⊖		on H_2O
	1130-45					Break.
	1150	Shear-Pet	1	⊖		
	1150	Leach's Type	1	⊖		
F	1155	Leach's SP	7			on H_2O Bl line rear.
	1955	Shear-Pet	1	⊖		
	1204	Leach's Type	1	⊖		
	1216	Leach's Type	1			
	1223	Leach's Type	3			on H_2O.
	1235	B-F Alba	1			on H_2O.
	1303	Leach's Type	1	⊖		following ships all dark.

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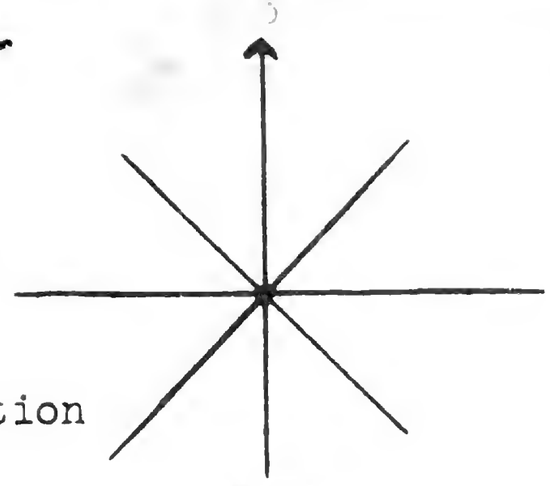

Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 28 Jan 1967

Pg.# 2

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
1311	Leach's Type	1	⊖		
1317	Storm Petrel	2	N		
1325	Storm Petrel	1	⊖		
1327	Leach's Type	2	NW		
1335	Manx Shear	1	⊖		
1346	Leach's Type	1	⊖		
~~1347~~					
1408	Leach's Type	4			an H20
1409	Leach's Type.	2	⊖		
1430	Leach's Type	2	⊖		
1432	Storm Petrel	1	⊖		
1436	Leach's Type	1	⊖		
1442	Leach's Type	1	—		
1453	Storm Petrel	1	⊖		
1520	Leach's Type	1	⊖		
1525	Leach's Type	4	⊖		Some feeding.
1533	Leach's Type	1	⊖		
1540	Leach's Type	1	⊖		
1546	Leach's Type	1	⊖		
1608	Storm Pet	1	⊖		
1612	Shear-Pet	1	⊖		
1617	Leach's Type	2	⊖		
1626	Shear-Pet	1	SSE		
1628	Pterodroma	1	SE		
1707	Leach's Type	1	⊖		
1716	Leach's Type	1	⊖		
1730					Coast
1744					Sunset.

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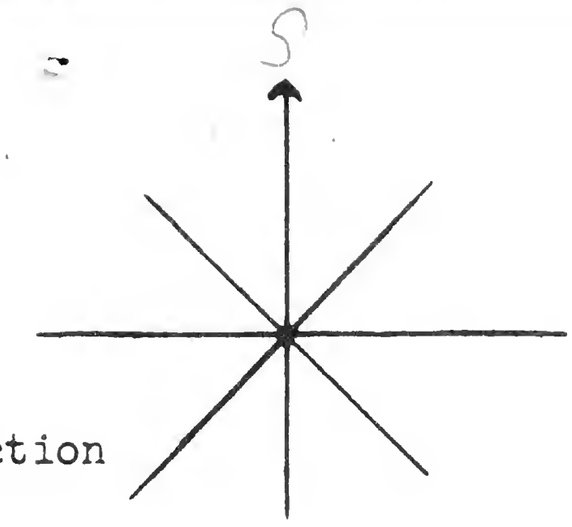


Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 29 Jan 1967
Pg.# 1

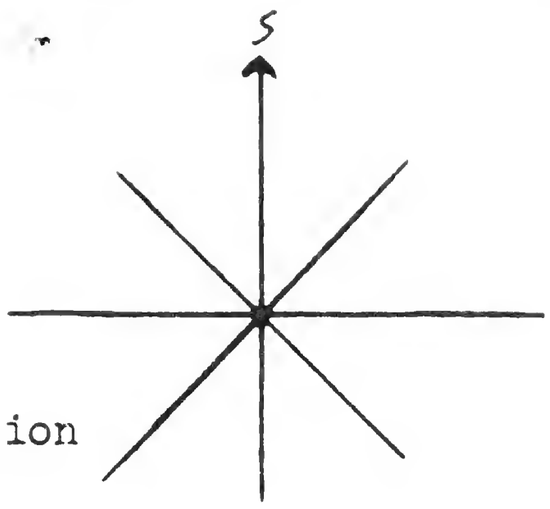
TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
0618					Sunrise
0655	StormPet	1	S		
0705	BF Alba	1			following
0710	StormPet	1	⊖		
0711	StormPet	1	⊖		
0715	BF Alba	1			Total of 2 all dark.
0715	StormPet	1	⊖		
0725					Underway.
0735	Storm Petrel	1	⊖		
0740	Leach's Type	1	⊖		
0747	Leach's Type	1	⊖		
0800	Bird	1	W		
0805	StormPet	1	⊖		
0810	Leach's SP	1	⊖		BO line seen.
0814					3 Cetaceans heading N. Black prob 8'10' small dorsal fin. No blowing. Moving slowly-gently breaking surface. Distant
0830	Storm-Pet	1	⊖		
0845	Leach's Type	2	⊖		
0850	Leach's Type	1	⊖		
0855	Leach's Type	1	⊖		
0911	Leach's Type	1	⊖		
0923	Leach's SP	2	⊖		
0928	Leach's Type	1	⊖		Black line seen.
1005	Leach's SP	1	⊖		
1006	P. puffinus	1	E		BO line seen.
1008	P. puffinus	2	⊖		
1020	StormPet	1			on H_2O
1020	Leach's Type	1	⊖		
1025	StormPet	1	⊖		on H_2O
1025	Storm Pet	1	⊖		
1027	Leach's Type	1	⊖		
1033	Leach's Type	1	⊖		
1045	Storm Petrel	1	⊖		
1046					Stop.
1100	Leach's Type	2	⊖		
1110	Leach's Type	1	⊖		
1130-45					Break
1150	BF Alba	1			Total of 3

BF Alba - 2
9-2
10-2
11-2
12-3

BF A - 3
Storm - 10
S P - 1
PP - 3
Leach - 4
Leach Type - 14
Bird - 1

36

NOTE - albatross are molting. old feathers are brown while new plumage is gray indicating 1st year birds.



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:
Woodward

Argo

Date 29 January 1967
Pg.# 2

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1534	Leach's Type	1			
1555	Leach's Type	2			
1622	Leach's Type	1			
1645	Shea-Pet	1			
1655	Leach's Type	1			
1725	Leach's SP	1			
1725	Leach's Type	2			
1731	Ø puffinus	1			
1731	Leach's Type	1			
ca 1748					Sunset sighting stop

Type 1
Type 8
Leach 1
S-P 1

Bl line rear

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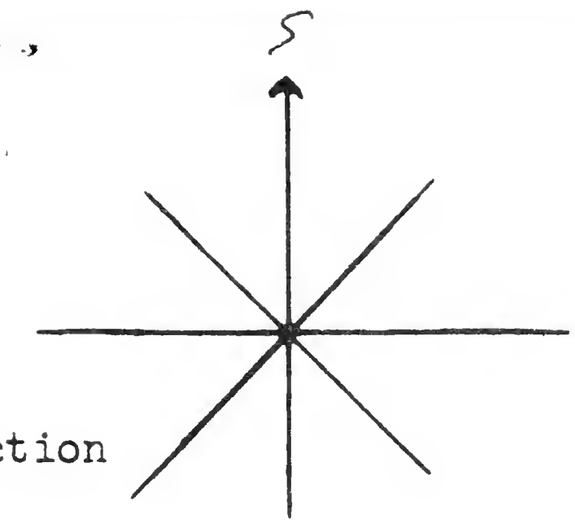

Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 30 Jan 1967
Pg. # 1

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
0629					Sunrise.
0646	Leach's Type	1	⊖		
0700	Phalarope	1			
0704	Leach's Type	1	⊖		on H_2O
0710	Storm Pet	1	⊖		
0719	Leach's Type	1	⊖		
0725	Leach's Type	1	⊖		
0728	P. neglecta	1	○		Brown - plumage similar to PIP but with dingy-colored lower breast & abdomen Intermediate phase.
0737	Leach's Type	2	○		
0737	Leach's Type	1	⊖		
0805	Storm Pet	1	○		
0815	Leach's Type	1	⊖		
0815	Bl-Faced Booby	1	—		Imm
0821	Storm Pet	1	○		
0828	Storm Pet	1	○		
0828	Storm Pet	1	⊖		
0844	Leach's SP	1	○		
0855	Leach's SP	1	⊖		Bl line reef.
0904	Storm Pet.	1	⊖		
0924	Leach's Type	1	⊖		
0925					STOP.
0927	Leach's Type	3	⊖		
0927	Leach's Type	2	⊖		
1015	Leach's Type	4			on H_2O
1015	Phalarope	1			on H_2O.
1116	Leach's Type	1	⊖		
1130-40					Break.
1214	Leach's Type	1	⊖		
1230	Leach's Type	2	○		
1237	[illegible]				Plankton Tow - 150° at 4 KTs.
FF 1300	Leach's Type	20±2	⊖		Same feeding ↗ Wings outstretched. Behavior of one bird - Flew low to H_2O very slowly - feet in H_2O paddling along for what distance repeated reversal. sim to Wilson's SP behavior but legs not long enough for this species. Body of bird was very close to H_2O.

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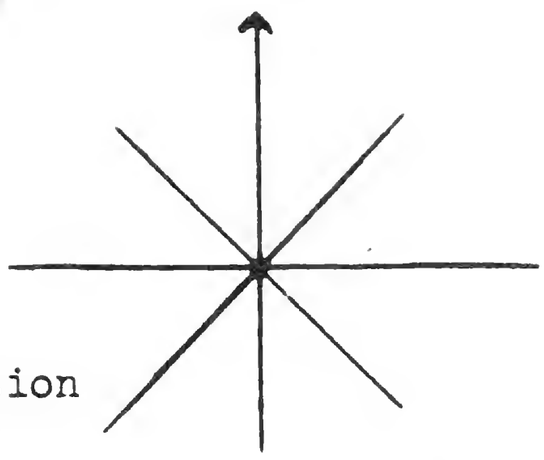

Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 30 Jan 1967

Pg. # 2

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
1328					Underway
1343	Leach's Type	1	⊖		
1343	Leach's Type	1	⊖		
1439	Leach's Type	1	⊖		
1444	P. puffinus	2	⊖		
1459	Leach's Type	1	⊖		
1511	Leach's Type	1	⊖		
1511	Leach's Type	1			on H2O.
1515	Leach's Type	1	⊖		
1525	Leach's Type	1	⊖		
1530	Leach's SP	3	⊖		Feeding, Bl line seen. One appeared to have a Velella in bill.
1537	Leach's Type	1	⊖		
1550	Leach's Type	1	⊖		
1610	Leach's Type	1	⊖		
1617	[redacted] Tropic (Type)	1	⊖		prob Red-bill.
1617	Leach Type	2	⊖		
1630	Leach's Type	1	⊖		
1630					Stop.
1635	Leach's Type	1	⊖		
1725					Underway
1732	Leach's Type	1	⊖		
1738	B-fac. Booby	1			Inm.
1752					Sunset

Leach's Type 1
Leach's Type 2
Tropic 1

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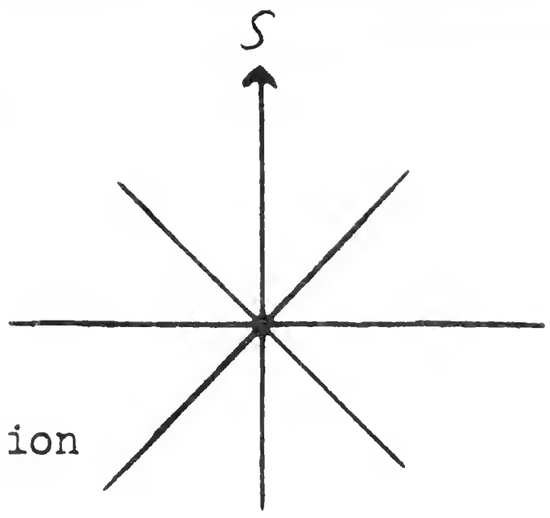


SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

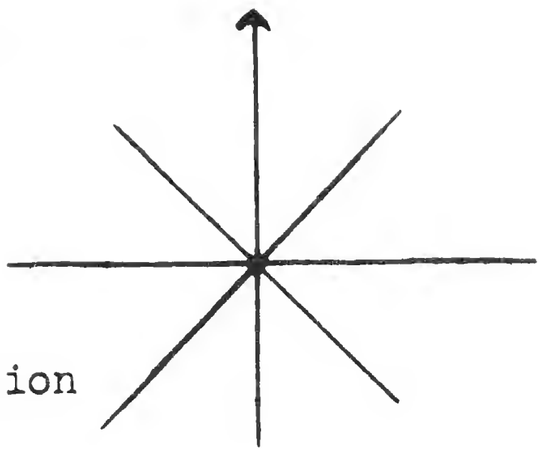
ARGO

Date 31 Jan 1967
Pg.# 1

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
0624					
0628	Leach's Type	1	o		Sunrise
0632	P. puffinus	1	o		
0651	Leach's SP	1	o		white axillars - auricularis?
0651					Bl line seen - feeding.
0655	Leach's Type	1	o		Stop
0655	Storm Pet	1	o		
0733	Leach's Type	1	o		
0754	Leach's Type	1	o		
0805	RTail Tropic	1	o		adv
0812					
0838	Leach's Type	2			Underway on H2O.
0914	Leach's SP	1	o		BO line seen
0914	Leach's Type	2	o		
0926	Leach's SP	2	o		Bl line seen. - one molting.
0935	Leach's Type	1	o		
0936	Leach's SP	2	o		Black line seen
0940	Leach's Type	1	o		
0944	Leach's Type	2	o		
0945					RTT Boven ship ~~indistinct~~ identical with 0805 bird assuming it is the same one. Orange bill - 6 tail feathers
0955	RT Tropic	1			joined other one. This one has red bill
1000	RT Tropic	1			Both birds calling.
SF 1017	Leach's Type	7			searching
1025	Leach's Type	2	o		
1040	Leach's SP	1	o		
1042	Leach's SP	3	o		Black line seen.
1050	Leach's Type	1	o		
1052	Leach's SP	4			on H2O Bl line seen.
1058	Leach's Type	1	o		
1105	Leach's Type	2	o		
1109	Leach's Type	2	o		
1112	Leach's Type	1	o		
1116	Leach's Type	1	o		
1121	Leach's Type	1	o		
1130	45				Break
1134					Stop for Station.
1154	Leach's Type	1	o		
1207	Leach's Type	4			on H_2O.

PP - 1
RTTB - 3
Leach 44
RT 35
Storm - 1
54

Mm = 1/2



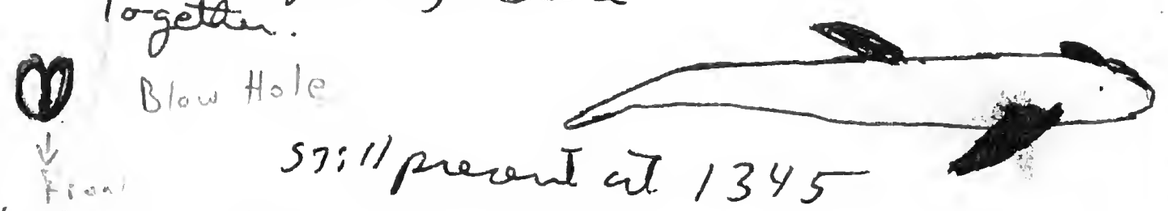
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 31 Jan 1967

Pg.# 2

	TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
	1230	Leach's Type	1	O		
	1240	Leach's Type	1	O		
	1245					Whale. Seems To be circling ship. (15-20' long Dark gray - no other colors seen. Small dorsal fin 6-8" high. Blow hole seen double and pointed poleward ly. a little apart. i.e. two openings close Together.
	1335	Leach's Type	1	O		
	1348	Leach's Type	1	O		
	1352	Leach's Type	1	O		
	1400					Blow Hole  Still present at 1345 another whale of same species present. Snout narrower in front - not blunt Towing 180° at 5 KTs
	1420	Leach's Type	1	O		
	1427	Storm Pet	1	O		
	1439	Storm Pet	1	—		
	1440	Leach's Type	1	O		
	1445	Leach's Type	3	O		
	1510					Underway-
F	1513	Leach's SP	1	O		Black line seen.
F	1525	Leach's SP	5			Bl line seen — on H20
	1526	Leach's Type	1	O		
	1534	Leach's Type	3	O		
	1542	Leach's Type	1	O		
	1547	Storm Pet	1	O		
	1553	Leach's Type	2	O		
	1555	Storm Pet	1	—		
	1558	Leach's Type	1	O		
	1604	RT Tropic	1			on H20
	1604	Leach's Type	2	O		
	1607	Leach's Type	1			Feeding.
	1608	Leach's Type	1	O		
	1611	P. puffinus	1	O		
36	1614	Leach's Type	1	O		
	1622	B-fac Booby	1			Imm
	1622	Leach's Type	1	O		
	1623	Leach's Type	2			on H20
	1633	Leach's Type	4	O		

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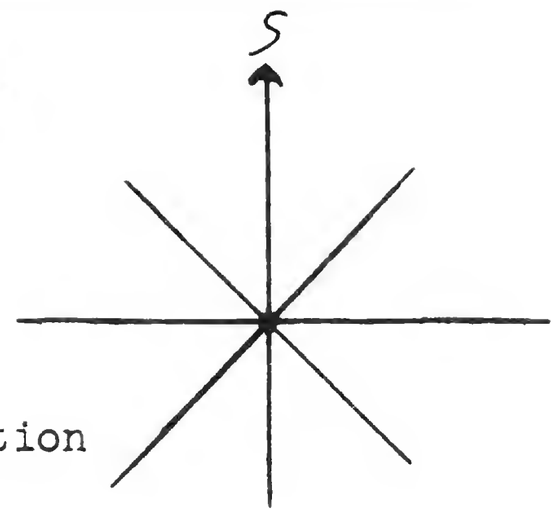


Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

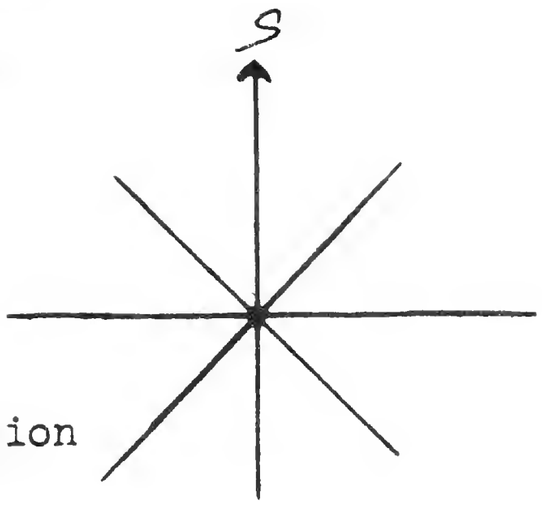
OBSERVERS: Woodward

ARGO

Date 31 Jan 1967
Pg.# 3

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	~~1637~~					
	1637	Leach's Type	1	O		
	1640	Leach's Type	1	O		
SF	1643	Leach's ~~SP~~	6	O		Bl line seen Searching
	1643	Leach's Type	1	O		
	1647	Leach's Type	2	O		
	1654	Storm Pet	1	O		
	1658	Leach's Type	1	O		Feeding. On H2O wings outstretched - picking food up in bill.
	1656	Leach's Type	1	O		
	1659	Leach's Type	1	O		
	1700	15				BREAK
	1720	Leach's Type	1	O		
	1721	Leach's Type	1	O		
	1724	Leach's Type	2	O		
	1728	Leach's Type	1	O		
	1733	Storm Pet	1	O		
	1733	Leach's Type	1	O		
	1737	Leach's Type	1	O		
SF	1738	Leach's Type	8	O		Searching
	1744	Leach's SP	3	O		Black line seen.
	1757					Sunset

Type - 29
Storm - 2
Leach - 3
34



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

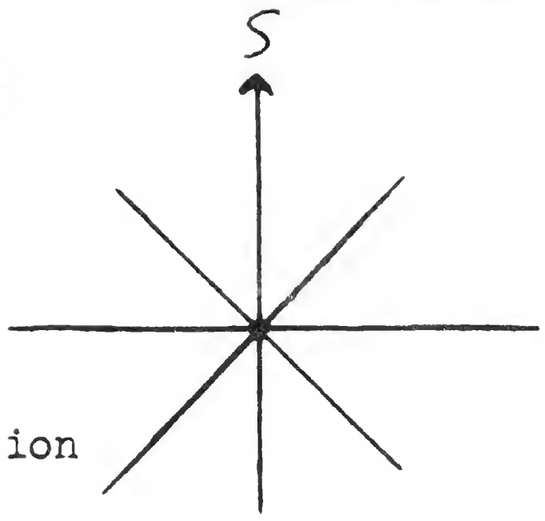
OBSERVERS: Woodward

ARGO

Date 1 Feb 1967

Pg. # 1

	TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
	0617					Sunrise
	0645					Underway
	0659	Leach's Type	1	O		
	0705	Leach's Type	1	O		
	0710	Wedgetails	1	W		light
	0711	Wedgetails	2	O		
	0718	Leach's Type	1	O		
	0721	Leach's Type	1	O		
	0721	R-Tai Tropic	1	O		
	0724	R-T Tropic	1			joined 0721 bird.
	0731	Leach's Type	1	O		
	0736	Wedgetails	1 /	W		light
	0750	Wedgetail	1	W		
SF	0810	Sooty Tern	6	O		Searching + adults
F	0819	Sooty Tern	10±2	O		Distant ~~feeding~~.
	0831	Leach's Type	1	O		
	0836	Leach's Type	1	O		
	[redacted]					
	0843	Bird	1	O		
	0847	Shear-Pet	1	O		
	0859	Sooty Tern	4	O		2 ad 2 imm - Brown somewhat white on underwing
	0902	Wedgetails	1	O		light + belly. prob 8± months old.
	0903	Wedgetail	1	W		
	0903	Leach's Type	2	O		
	0905	Leach's Type	3	O		
SF	0911	Sooty Tern	10±2			at least 2 imm
	0911	Leach's Type	3	O		
FF	0933	Leach's Type	7	O		Some feeding
	0933	Sooty Tern	1	O		
	0942	Wedgetail	1	W		light phase
	0942	Wedgetail	1	O		
	0955	Sooty Tern	3	O		
	0955	Leach's Type	1	O		
TF	1000	Sooty Tern	12	[redacted] E		+ Traveling



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

ARGO

Date 1 Feb 1967
Pg.# 2

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1006					STop
1036	Leach's Type	1	O		
1042	RT Tropic	4	O		calling.
1045	Leach's Type	1	O		
1050	RT Tropic	2	O		
1103	Leach's Type	1	O		
1240					underway
1245	Wedgetail	1	O		light phase
1300	Leach's Type	1	O		
1315	Leach's Type	1	O		
1321	Wedgetails	1	W		Light
1325 SF	1345 Sooty Tern	100±15			at least 50 adult plumage
	Wedgetail	25±5			
	1358 Leach's Type	2	O		one dark rest light - nally plumage very
SF	1405 Sooty Tern	45±5	O		worn Searching.
	Wedgetails	3			Searching
	1411 Jaegers sp	2			Light) ant H_2O.
	1438 Leach's Type	1	O		
	1440 R-T Tropic	1	O		
	1442 Leach's Type	1	O		
	1456 Wedgetail	1	O		Light phase.
	1510 Wedgetail	1	W		light phase.
	1524 Wedgetails	1	O		light phase.
	1533 Leach's Type	1	O		light phase
	1549 Wedgetail	1	E		light phase.
	1600 Wedgetail	1	O		light phase.
1	1601 Wedgetail	1	W		light phase
	1601 Leach's Type	1	O		
FF 361	1601 Sooty Tern	100±10	O		Feeding. Distant.
	1636				Stop
	1640 Wedgetails	2	O		light phase. Worn plumage.
	1650 - 1710				Break
	1726 Steam-Pit	1	O		
	1800				Sunset

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO
DATE 2 Feb 1967
Pg.# 1

	time	species	#	dir.	hgt.	remarks	loc.
	0618					Sunrise	
	0640	Tern sp	1	∞			
	0650	RT Tropicbird	1			Following - subadult	
	0707	RT Tropicbird	1				
	0707	Stormpet	1	∞			
	0709	Wedgetail Sh	2	W		light phase.	
FF	0740	Sooty Tern	100±10				
		Wedgetail	3			Feeding.	
						light	
	0741	Leach's SP	1				
	0743	Leach's SP	1			Bl line seen	
	0759	Leach's Type	1				
	0805	Wedgetail	1			light.	
	0815	Wedgetail	2			light	
FF	0816	Sooty Tern	75±5			feeding	
	0820	Wedgetail	1			light	
	0821					Stop.	
	0906	Wedgetail	1	WNW		light phase.	
	0944	Wedgetails	1	WNW		light phase.	
	1003	Wedgetails	1	WNW		light phase.	
	1036	Wedgetails	1			light phase.	
	1041	Wedgetails	1	WNW		light phase	
	1050	Wedgetails	1	WNW		light	
	1125	Leach's Type	1			light.	
	1130 — 1300					BREAK	
	1315					Whale - similar to ones that were around ship the other day.	
	1400	Leach's Type	1				
	1403	Leach's Type	2			feeding	
	1410	R-foot Booby	1			Subadult	
	1410	Leach's Type	1				
	1430	Leach's Type	2				
	1435	Storm Pet	1				
	1516	Leach's Type	1				
	1530	Leach's Type	1				
	1600					Rain	
	1615	Wedgetail	1			Light phase	
	1645	Storm-Pet	1				

1-FB-1
Tern 1
RTTB 1
Storm 2
WTS 16
S-P 1
ST 175
Leach 2
LT Type 10
210

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

DATE 2 Feb 1967
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1700					Rain cease	
1700-1801	15				Break	
					Sunset	

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

Argo
DATE 3 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0616					Sunrise	
0630						
0639					Begin 065. Sun already up ca 15°	
0647	Shear Pet	2			underway.	
0704	Pom Jaeger	1	WNW		Intermediate Phase	
0709	P. externa	1				
0735	Shear-Pet	1				
0801	Shear-PeT.	1				
0803	R-T Tropic	1			following ship	
0814	Leach's Type	1			↑ joined 0803 bird.	
0815	R-T Tropic	1				
0817	P. externa	1				
0820	Leach's Type	1				
0829	Leach's Type	1				
0834	J. F. Petrel	1				
0851	Shear-Pet	1				
~~0855~~	~~Shear-Pet~~					
0855		1				
0903	PTerodroma	1				
0930	Leach's Type	1				
0930	Wedgetail	1			Light phase.	
0945	Leach's Type	3				
0947	PTerodroma	1				
0948	Leach's Type	1				
0954					Stop.	
1034	P. externa	1				
1107	Wedgetails	1			Dark phase.	
1220	J F Petrel	1				
1319					Underway.	
1334	P. Externa	1				
1344	Wedgetails	1			Light phase.	
1354	J F Petrel	2				
1355	J F Petrel	1				
1405	P. externa	2				
1406	P. externa	1				
1406	Wedgetail	1			Light phase.	
1410	J F Petrel	1				
1418	P. externa	1				
1441	Leach's SP	2			on H2O Bl line ahead.	

S-P 6
Ptero-2
PJ-1
Pex 8
RTT 2
R Type 8
R-T 2
JF 6
WTS 4
39

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG -- E

DATE 3 Feb 1967
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1441	J F Petrel	1	a			
1445	JF Petrel	1	a			
1445	J F Petrel	1	O			
1445	Reach; Tyer	1	O			
1500					Rain	
1515	Wedgetail	1	O		Light phase	
1535	JF Petrel	1	O			
1535	Wedgetail	1	O		Worn plumage Light	
1556	JF Petrel	1	O			
1600					Rain stopped	
1605	JF Petrel	1	O			
1606	Tahiti Pet	1	O		almost sure of ID. appeared Brown and larger (esp. wings) than PIP.	
1606	JF Petrel	1	O			
SR 1608	Sooty Tern	6			Seeding	
1615	Many Sheart	1				
1615					Stop	
1616	JF Petrel	2	O			
1654	Wedgetail	1	O		Light phase	
1720	Jaeger sp	1	e			
1740	Wedgetail	1	e		dark	
1750					Underway	
1751	Sheartail	1	O			
1755	JF Petrel	3	O			
1758					Sunset	

JFP 1
Type 1
WTP 4
Tahiti 1
ST 6
WT 1
Jaeger 1
SI 1
17

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO

DATE 4 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0614					Sunrise	
0645					Begin Obs. on station	
0700	RTTropic	1				
0700					Underway Heading W.	
0716	Petrel-Shear.	1	Q			
0718	JF Petrel	1	o			
0720	Shear-Pet	1	O			
0723	P. externa	1	o			
0723	Leach's Type	1	o			
0735	P. externa	1	o			
0735	P. alba ssp. rosi.	1	o			
0737	Leach's Type	1	O			
0738	Leach's Type	2	o			
0740	JF Petrel	1	o			
0750	Pterodroma	1	o			
0755	Leach's Type.	1	o			
0758	P. externa	1	o			
0800	P. externa	1	o			
0805					Stop. Drifted ca 12 miles To E last site while on station.	
0815	Shear-Pet	1	o			
0830	P externa	1	o			
0855	JF Petrel	1	o			
0928	P. externa	1	o			
0928	Shear-Pet	1	o			
0930	Leach's Type	1	o			
0946	Wedgetail	1	o		light phase.	
0947	Wedgetail	1	o		Dark phase.	
1045	Leach's Type	1	o			
1050	JF Petrel	1	o			
1205	Shear-Pet	1	o			
1229	Frigate sp	1	O		Immature	
1234	Wedgetail	1	O		Dark phase	
1237					Underway	
1250	jaeger sp!	1	o			
1256	Leach's Sp	1			on 120 BL line recn.	
1302	Sooty Tern	1	N			
1320					Sperm Whale 2 — Lying on surface spouting - Blow goes forward ca 4' high 40-50' long very small dorsal fin	
1323					Porpoising 75± 5 Feeding	
1326	Shear Pet	1	o			

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO
DATE 4 Feb 1967
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1331	Leach's Type	1	S			
1338	Shear-Pet	1	S			
1350	Leach's SP	1	S		Bl. line seen.	
1408	Leach's Type	1	S			
1413	P. externa	1	S			
1425	Shear Pet	1	S			
1458	P. externa	1	S			
1507	J F Petrel	1	S			
1520	J F Petrel	1	S			
1521	P. externa	1	S			
1529	P externa	1	S			
1530	J F Petrel	1	S			
1536	P. externa	1	S			
1540	Shear-Pet	1	S			
1546	J F Petrel	1	S			
1548	P. externa	1	S			
1554	J F Petrel	1	S			
1555	P externa	2	S			
1559	Pterodroma	1	S			
1600	J F Petrel	1	S			
1600					Stop	
1606	P externa	1	S			
1607	P. externa	1	S			
1655	Shear-Pet	1	S			
1705	20				Break	
1729					Underway.	
1730	J F Petrel	1	S			
1735	Leach's Type	1	S			
1739	Leach's SP	1	S		Black Tern seen.	
1741	Wedgetails	1	W		Light phase	
1743	Shear-Pet	1	S			
1750	P externa	1	S			
1801	Tahiti Pet	1	S			
1807					Sunset	

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S

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO

DATE 5 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0610						
0620	Shear-Pet	1	E			
0643	Shear. Pet	1	O			
0644	Storm Pet	1	O			
0644	J F Petrel	1	O		on H_2O	
0653	Leach's Type	1	O			
0655					Course change to 235°	
0656	RT Tropic	1	O			
0717	Shear Pet	1	O			
0729	Leach's Type	1	O			
0735	Wermadec Pet	1				
0736	Leach's Type	1	O		Intermediate phase.	
0738	Leach's sp	1	O		Bl line seen.	
0745	Leach's Type	1	O			
0746	Leach's Type	1	O			
0810						
0830					STOP	
0845					Underway 180°	
0855	Leach's Type	1	O		15 ± 2 Porpoises	
0902	Leach's sp	2	O		Bl line seen.	
0910	Leach's Type	1	O			
0923	Leach's Type	1	O			
0932	Leach's Type	1	O			
0932						
0945	Leach's Type	1	O		~~60 Porpoises~~ Porpoises	
0954	Sooty Tern	10				
0959	Leach's Type	1	O		Same reading	
1010	Wedge tails	1				
1018	Leach's Type	1	O		Dark phase.	
1030	Leach's Type	1	O			
1032					STOP	
1110	Leach's Type	1	O			
1111	Leach's Type	1	O			
1115-1200					Break	
1201	Leach's Type	1	O			
1330					Underway. S/T's planted on Tow. 1420 Resume 12 kts reading 145.0 1510 @ 180°	
1446	Tahiti Pet	1	O			
1517	Leach's Type	1	O			
1537	Shear Pet	1	O			

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO

DATE 5 Feb 1967
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1549					20±5 Porpoises distant.	
1600					Stop	
1620					Underway	
1623	Read's SP	3			Bl line rear.	
1633					Cetacean - cas' Black - Med-size dorsal fin in pa to body - Just lying on surface not moving or spouting - Submerged quietly.	
1641					10±2 Porpoises	
1644	Leach's Type	1				
1650	Leach's Type	1				
TF 1655	Wedgetail	8	E		Traveling	
	Sooty Tern	5				
1703	Leach's Type	1			Dark phase	
1705	20					
1730	PI Petrel	1			Bread.	
1730	Leach's Type	1			Appeared black.	
1735	Shear-Pet	1				
1737					6' Hammerhead Shark feeding on small fish.	
1737	Leach's Type	2			on H2O	
1750	Leach's Type	2				
1751	RT Tropic	1			Imm - dark bill decay - yellow.	
1805					Stop	
1810					Sunset Green Flash.	

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

DATE 6 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0609					Sunrise	
0630					Begin Obs. Heading 125°	
0640	Leach's Type	1	O			
0700	Leach's Type	3	O			
0703	Leach's Type	3	O			
0704	So. Ty Tern	1	O			
0716	Leach's Type	1	O			
0720	Leach's Type	1	O			
0740	Leach's Type	1	O			
0753	Leach's Type	1	O			
0755						
0814	Leach's Type	1	O		C/O 180°	
0845						
0845	jaeger sp	1	O		Whale spouting, ① distant	
0850						
0913					Stop	
1010					Underway.	
1020	Leach's SP	2	O			
1027	Leach's SP	2	O		Black line rear	
1030						
1045	Leach's Type	1	O		1022 Whales? Laying at surface of H_2O not moving a spouting maybe 15-20' Start dorsal fin similar to 1010 sighting. Body deep gray	
1101					STOP	
1125	Leach's Type	2	O			
1140-50					BREAK	
1208	Leach's Type	1	O			
1246	Leach's Type	1	O			
1420					Begin Plank Tow STTS 1400 1510 Resume speed 125° ↓ 1624 C/O 180°	
1421	Leach's Type	2	O			
1430	Leach's Type	1	O			
1510	Leach's Type	2	O			
1525	Leach's Type	1	O			
1530	Sooty Tern	4	O			
1555					10 Cetaceans	
1555	Leach's Type	1	O			
1631	Leach's SP	1	O		Bl line rear.	
1656	Leach's Type	1	O			
1705	Leach's Type	1	O			

Leach Type-26
ST-5
Jaeger-1
Leach's-5

37

Porpoises 1-10-15 moving South
2-Start dorsal fin little slant to portion
3-
4-Fin appeared black body gray ?

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DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO

DATE 6 Feb 1967
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1714	Leach's Type	1	O			
1720					Stop	
1720	30					
1750					Break	
1814					Underway.	
					Sunset Greenland	

Leach Type 1

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO

DATE 7 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0606					Sunrise	
0640					C/O 120°	
0653	Sheam Pet	1	0			
0714					Stop	
0734					Underway C/ 180°	
0750	Leach's Type	1	0			
0927					Stop.	
1045-1145					Break.	
1202					Plant Tow @ 5 KTS ~~150°~~ 150° 1255 Rcame/ 2 KTS	
1340					C/O 180°	
1430-1500					Break	
1520	Leach's Type	1	0			
1616	Leach's Type	1	0		C/O 160°	
1645					Stop.	
~~1739~~						
1740					Leave 0 hr Still on station	

S-P 1
Leach's Type 3

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

DATE 8 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0604					Sunrise	
0630					Bojen 065/170°	
0645					C/O 1350	
0702	P Cook's	1	NW			
0714					Stop	
0815	Frigate (Juv)	1	ø			
0845	Leach's Type				Underway 165°	
0900	[illegible]	1	S		[illegible]	
0915	Leach's Sp	1	ø		Bl line seen	
0915	Leach's Type	2	ø			
0957	Leach's Type	1	ø			
1018	Leach's Type	1	ø			
1021	Leach's Type	1	ø			
1025	Leach's Type	1	ø			
1026	Leach's Type	1	ø			
1033					C/O 1450	
1033	Leach's Type	1	ø			
1040					Stop.	
1115	Leach's Type	1	ø			
1125	Leach's Type	1	ø			
1130	45				BREAK.	
1325					Plank Tows 5 KTS 165°	
1410	Leach's Type	1	ø			
1415					Resume speed 12 KTS 160°	
1450	Leach's Type	1	ø			
1515	Fairy Tern	1	ø		def not Tropicbird but may have been Arctic Tern etc.	
1541					Stop	
1602					Underway.	
1636	Leach's Type	1	ø			
1644	Leach's Type	1	S			
1700	15				BREAK	
1719	Leach's SP	4	ø		Bl line seen.	
SF 1736	Sooty Tern	7	ø		Milling about	
1750					Stop.	
1810					Green Flash Sunset	

C-R — 1
Leach's - 5
P - 1
B - 1
ST - 7
Frig - 1
T - 1
Tern - 1

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7-28-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO

DATE 9 Feb 1967
Pg.# 1

	time	species	#	dir.	hgt.	remarks	loc.
	0601					Sunrise Orientation	
	0655	R-Fo Booby	1	⊖		subadult	
	0725					Underway.	
FF	0925	SootyTern	20	⊖		Feeding	
	0926	SootyTern	4	⊖			
	1048					some feeding & flying fish jumping.	
FF	1200	SootyTern	10±2			Stop.	
	1337					Same feeding.	
						Underway 180° 5 KTS Plan Tow	
	1440					1425 Resume speed.	
	1450					Stop	
	1619	Bkear-Pet	1			underway	
FF	1630	SootyTern	5	⊖			
TF	1635	SootyTern	60±5		E	feeding.	
	1647	SootyTern	1	⊖		traveling.	
	1655	R-TTropic	1			Imm. Subadult heavy speckling, mottled bill	
	1700-15					Break	
	1741					STOP	
	1824					Summit.	

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO
DATE 10 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0558					Sunrise	
0630					Begin Observations	
0730					STOP	
0740	Wh-Thr S Pet	1	[illegible]		Ex woman plumage. Kicking off H_2O. Int hitching, with left leg and flying a little sidewards. 2nd time Flying along in straight line bouncing off H_2O with both feet.	
0905					underway	
1100					STOP	
1145–1300					Break.	
1425	Leach's Type [illegible]	1	W		[illegible]	
1430						
1517					PR Tow 5 KTS 180°	
1545	RT Tropic	1			underway	
1628	Pterodroma	1	[illegible]		adult on H_2O.	
1629	Shem-Pet	1	[illegible]			
1725–40					Break.	
1758	Wh-Thr SP	1	[illegible]		Very erratic Kicking off H_2O appeared to be right foot Later all movement of.	
1801	Sooty Tern	42	ENE		Feed twice - but generally traveling.	
1815	WL-Thr SP	1			slight kicking off	
1825	S				Sunset - Liz	

WTSP-3
BTeio 1
S-P 1
C. leuco 1
RTTB 1
ST - 42

49

39
26

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S

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO
DATE 11 Feb 1967
Pg.# 1

	time	species	#	dir.	hgt.	remarks	loc.
	0555					Sunrise	
	0615					Begin obs at station sin a 05-32	
	0655	R-T Tropic	1	a		adult.	
	0700					Underway.	
	0715	~~Bird~~ Herald's Pet	1	@		Interphase PIP pattern	
	0716	P. leuco. mas.	1	@			
MF	0820	Sooty Tern	11	@			
MF	0905	Sooty Tern	22	@	350'	Milling	
FF	0930	Fairy Tern	3			ad Milling	
	↓	Sooty Tern	100±15				
	0945	Frigate	2	@		Feeding.	
		Fairy Tern	2				
	1000	FAiry Tern	1	a			
F	1017	Sooty Tern	28	@			
	↓	Frigate	2	@		Some feeding	
	1025					STOP	
	1030						
	1120	Leach's SP	1	@		Bl line seen.	
	1215-1345					BREAK	
	1535					Plant Tow - Begin	
	1625					Resume speed.	
	1700-10					Break	
	1727	Sheartail	1	a			
	1756	Bird	1	~~BRN~~			
	1826					Sunset.	

21-73
9 1174

RTTB-1

Wisp 1
ST 161
FT 6
Leach's 1
S-P 1
Bird 2
Frigate 41

177

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO

DATE 12 Feb 1967
Pg.# 1

	time	species	#	dir.	hgt.	remarks	loc.
	0554					Sunrise	
FF	0618	Sooty Tern	15	±2 ○	○	feeding	
	0618	~~Tropicbird~~					
	0618	Tropicbird	1	○			
	0625	Sooty Tern	3	○		adults	
TF	0634	Sooty Tern	19	E		Traveling	
	0636					STOP	
	0644	Storm Petrel	1	○			
	0805					Underway	
	0817	RT Tropicbird	1				
	0850	Pom. jaeger	1	○		adult on H2O,	
	0916	WT Tropic	1			Inter phase	
	0923	~~Red-tailed~~	1	○		on H2O adult	
		Red-Tail Tropicbird	1	○			
	1100						
	1135					STOP	
	1145	1315				BREAK	
	1420						
	1453	WA-Th-SP	1	○		STATS 180°	
	1510					Kicking slightly with right foot	
	1538	Sheartail	1	NE		Resume speed	
	1544	Pom Jaeger	1	○			
FF	1649	Fairy Tern	2			Inter phase.	
		Sooty Tern	18				
	1700	10				Feeding.	
FF	1726	Sooty Tern	125	±25 ○		adults	
	1744	RT Tropic	1	○		Breeds	
	1810					some feeding	
	1828					Subadult	
						STOP	
						Submt.	

ST - 180
Tropic - 1
Storm - 1
RT TB 3
PJ - 2
WT Tropic - 1
Sooty - 1
WT SP - 1
S - P - 1
FT - 2
193

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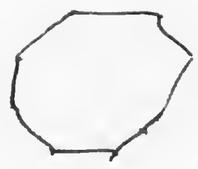
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARGO
DATE 13 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0551					Sunrise	
0620					Begin Obs. on station	
0745					Underway	
0750-0810					Rain.	
0814	Tropicbird	1	SW			
0843	Bird	1	W			
0851	RT Tropic	1	S			
0855	Jaeger(sp)	1	SW			
1000	Bird	1	W			
1001	RT Tropic	2	W			
1003	Jaeger(sp)	1				
1044	Bird	1	SW			
1045	Fairy Tern	1	W			
1113	Phalarope	1	W			
1131					Stop	
1142	Fairy Tern	2	-			
1300-50					BREAK	
1353					RR tow 5 kts	
1415	R-T Tropic	1	W			
1440					Resume 2 speed.	
1449	WT Tropic	1	W			
1516-24					Rain	
1525	Fairy Tern	2	SE			
1545	Fairy Tern	1	E			
1546	Phalarope	1	NW			
1550	Phalarope	1	N			
1606	RT Tropic	1	—		adult	
1700-10					Break	
1736						
1834						

Tropic - 1
Bird - 3
RTB - 5
WTB - 1
SW 2
BkD 3
FT 6
21



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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

DATE 14 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0549					Sunrise	
0610					Begin Obs on station	
0617					Underway.	
0655	Shorebird	2	N			
0712	Phalarope	1	NW			
0735	Phalarope	1	NW			
0740	Phalarope	1	NW			
0856	Pterodroma	1	N			
0933					Slop	
1043	Shear. Pet	1	E			
1100-1145					BREAK	
1500-43					PT STS 1800	
1700-15					Break.	
~~1834~~						
1834					Sunset	

Shear 2
Phal 3
Pter 1
S.P. 1
6-7-2-0

4-50
5-15
1-19
10-84
11-24

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

DATE 15 Feb 1967
Pg.# 1

W

time	species	#	dir.	hgt.	remarks	loc.
0551					Sunrise	
0648					Underway.	
0843	Shear-PeT	1	E			
0849	Fairy Tern	1	E			
0855	Phalarope	1	N			
1003	Fairy Tern	1	S			
1042					Stop.	
1200-1300					Break	
1315-1405					Pt Shts 270°	
1700-10					Break	
1713	Sooty Tern	4	E			
1745					Stop.	
1842					Sunset	

-2
E 2 - 1
N 1 - 1
S T - 4

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

ARG-O.

DATE 16 Feb 1967
Pg.# 1

W

time	species	#	dir.	hgt.	remarks	loc.
0605					Sunrise Operation	
0653	Pterodroma	1	N			
0730					Underway	
0911	R-T Tropic	1	NE		adult.	
0925	Herald's Pet	1	E			
1045	Fairy Tern	1	E		Close look - Brown-PIP pattern - white patch at end of wing + white line thru middle of wing	
1049	Fairy Tern	1	E			
1110					Stop.	
1125	Fairy Tern	1	E			
1145 -	1315				Break.	
1345	Pterodroma	1	S			
1412					PT STS 270°	
1501					Resume Speed.	
1700					Break.	
1738	[redacted] Murphy's Pet	3	S			
1813	[redacted] Tern	1	E		all dark - med size - ~~light~~ high arcing. straight directional flight. No white seen in wings. Lighting not good possibly Kermadec a Herald's. 99% sure they were not any of the other all dark Procellariformes.	
1841					Stop	
1856					Sunset.	

Ptero - 2
RTTB - 1
Fen - 1
FT - 3
Tern - 1
[redacted] - 3
11

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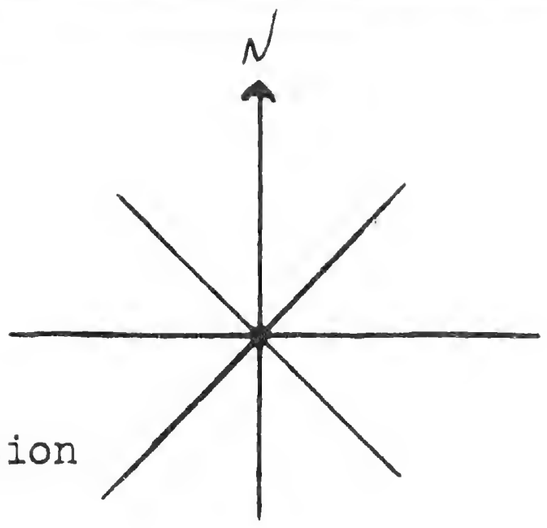
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG — E

DATE 17 Feb 1967
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0617					Sunrise Orientation.	
0703	Bird	1	←			
0719					Underway.	
0744	Fairy Tern	2	O			
0801	Shear. Pet	1	←			
0810	Fairy Tern	1	O			
0939	Fairy Tern	1	O			
1026					Stop.	
1030 - 1130					BREAK	
1150	Bird	1	O			
1300 - 50					PT STT SS 360°	
1510 - 24					Rain	
1620	Shear. Pet	1	S			
1631	Fairy Tern	2	O			
1648					Stop	
1742	RTTropic	1	O			
1822					Underway.	
1854					Sunset	

FTG
S.P-1
S.P-2
Bird-2



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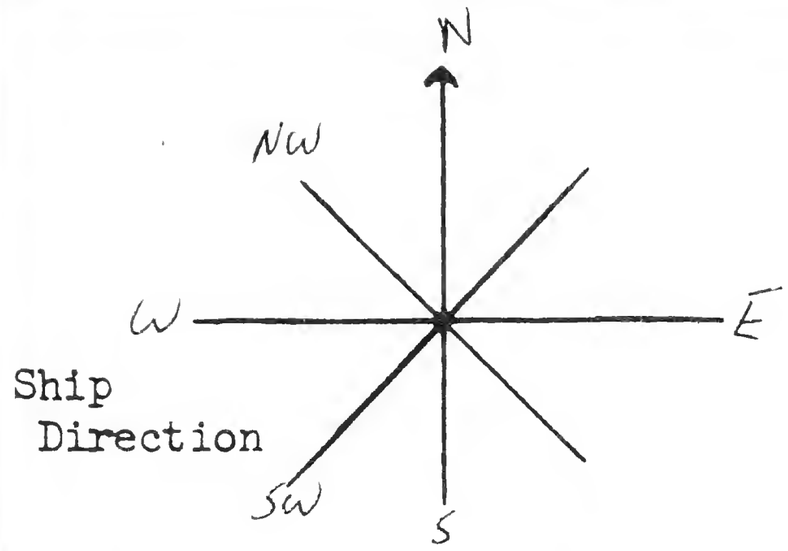
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 18 Feb 1967
Pg.# 1

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
0620					Sunrise
0630					Begin Obs
0658	PTerodroma	1	e		
0731					Stop
0735	Phalarope	3	NW		
0858					Underway
1123	FairyTern	1	e		
1140					Stop
1145	BtFaBoobY	1	e		~~adult~~
1145-1315					(~~rpt~~ repeated by watch)
1350	PTerodroma	1	N		Breach.
1413-1500					
1720-30					PT 360° 5 KTS
1753	Phalarope	1	N		Breach
1804					
1808	Phalarope	2	NW		Stop
1853					~~Sunset~~ Sunset

PTero - 2
Phal - 1
Phal - 6
FT. 1
10



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 19 Feb 1967
Pg.# 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0622					Sunrise
0702	WTTropic	1	⊕		WTTB-2
0716	Phalarope	1	N		Phal-1
0745	Sheam Pet	1	⊖		S-P 1
0815	RTTropic	1			
0823	Bird	1	⊖		Sub adult in H_2O
0855	Bird	1	•		Pet-1
0910	Herald's PeT	1	⊕		RTTB-2
0915	Bird	1	⊖		Inter phase 320
0925	RT Tropic	1	⊖		Bird 4
FF 0947	SootyTern	30±2			Sub adult. Head-1 28
	frigate	2			ST-381 381
0950					Same feeding. Bird 12 107
F 1015	SootyTern	95±5	⊖		ST opr
↓	frigate	3			GF-1
1300	frigate	3			Noddy F-1
	GFrigate	1			Feeding
					RTJ-2
1030	WTTropic	1	⊖		Adt
1130-1200					409
1253	Bird	1	×		Breed.
1320	P. esterica	1	⊖		PT 360 @ 5 KTS
1330					
FF 1458	SootyTern	70±10			Underway
	frigate	3	⊖		Same feeding.
1507	[redacted]	1	NW		[redacted]
	Phalarope				
1515	Long-Tailed?				Slightly larger than Noddy - very little white in wings - white belly - dark brown breast band - br. back.
FF 1525	SootyTern	2	⊖		
ST 1605	SootyTern	125±25			Distant feeding.
FF 1617	SootyTern	26	⊖		milling.
	frigate	35±5	⊖		
		1			feeding
1637					
1805					ST opr
1851					Underway
					Sunset

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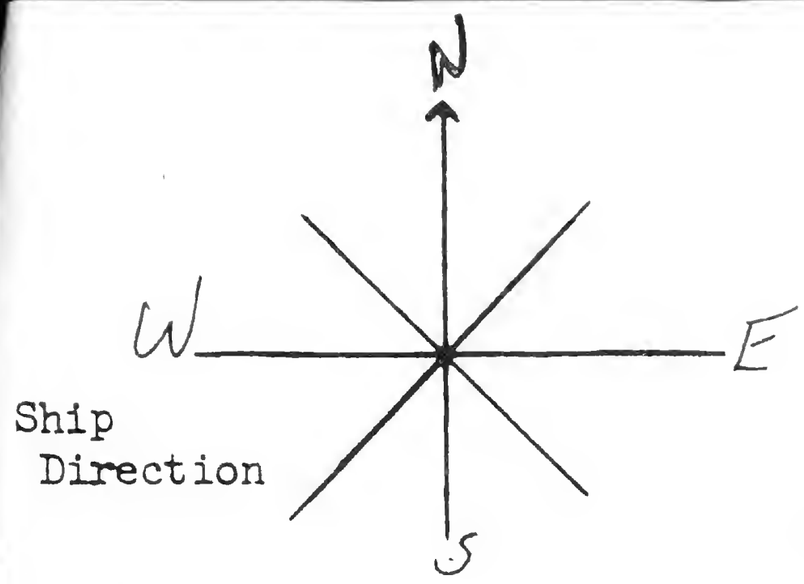

Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 20 Feb 1967
Pg.# 1

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	0630					Sunrise 0 rotation
	0710	Bird	1	o		
	0730					Underway
	0802	SootyTern	2	o		
F	0805	SootyTern	75±5			adults
		Frigate	1	o		Searching
		L-T Jaeger	1			
	0830	Herald's P	1	o		Enter. phase.
F	0840	SootyTern	20±2			Searching.
	0848	PhRedangel	2	o		
F	0858	SootyTern	100±10	o		adults milling
F	1025	SootyTern	60±5	o		milling 2 immature adults
		frigate	4			
	1025	FairyTern	2	o		
	1045	Red Phala	1	o		on H2O
	1046					STOP
	1145-1215					Break
	1309-50					PT STN 3600
	1436	frigate	1			
F	1520	Sooty Tern	10	o		adults Searching
		FairyTern	5	o		
F	1605	SootyTern	35±5	o		
	1640	FairyTern	1	o		Sm feeding.
	1653			o		feeding.
	1730-1800					STOP
	1815					Break.
	1832	WTherSP	1	o		Underway
	1848					Sunset

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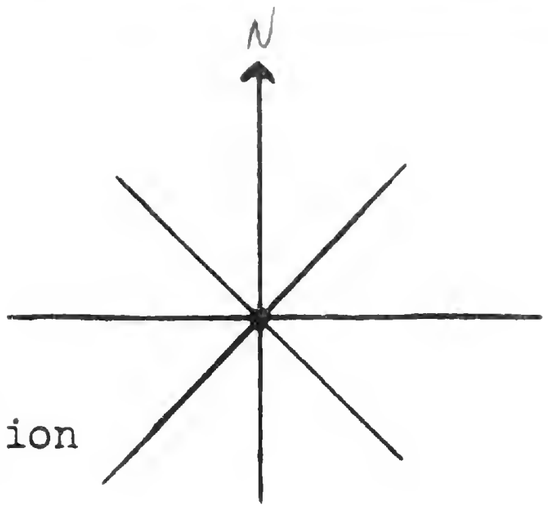

Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

Date 21 Feb 1967
Pg. # 1

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	0628					Sunrise
	0637	Frigate sp	1	o		
F	0730	Sooty Tern	15±2			
		Frigate sp	1	o		Scanding
	0755	Lon's SP	3	e		Bl line seen
	0820	Fairy Tern	4			
	0835	Bird	1	o		
	0951	Storm Pet	1	o		
	1001					Stop
	~~1155~~			/		
	1015 – 1130					Bread
	1155	WhTh SP	1	o		
	1246 – 1331					
	1430					PT STIS 1360
	1445	WhTh SP	1	e		
		Sooty Tern	3	o		Flicking off
F	1540	Sooty Tern	27±2	o		adults
		Frigate	1			some feeding
		Fairy Tern	4			
	1624					STOP
	1630	Bird	1	o		
	1727	RT Tropic	1	e		
	1744					feeding
	1748	WTh SP	1	o		underway
	1836	Fairy Tern	1	o		
	1837					Sunset

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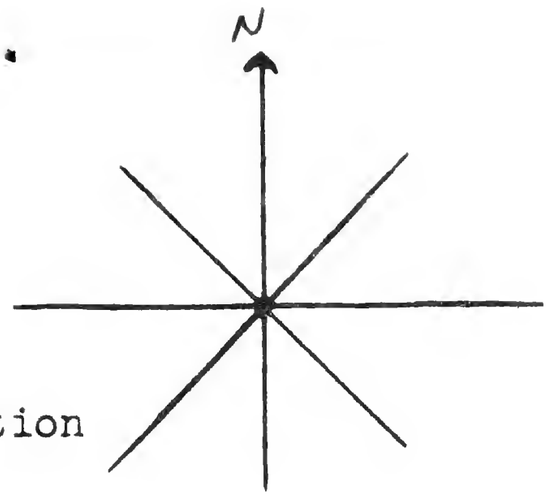


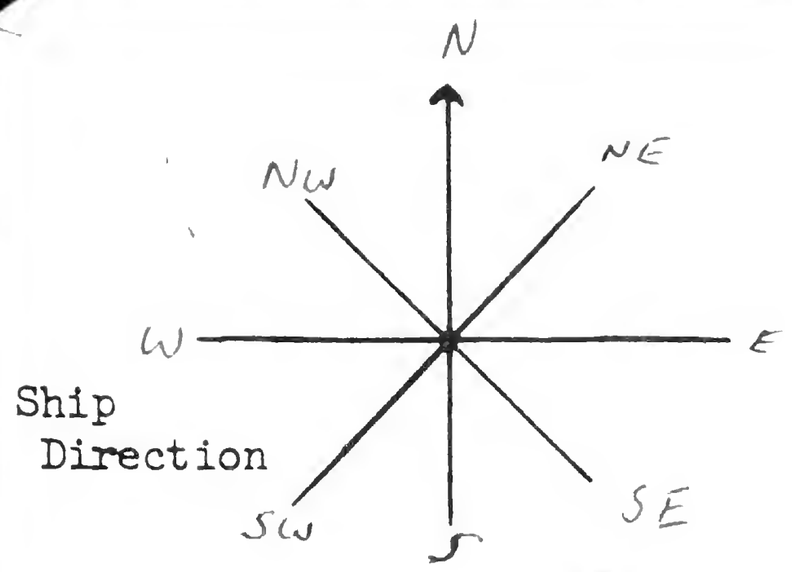
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:
SR-8 Woodward
8-10 Woodward
10-12 PNW
12-14 Woodward
14-16 Woodward
16-18 Woodward

Date 22 Feb 1967
Pg.# 1

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	0631					Sunrise
	0640	Storm Pet	1	a		
	0725		↓			Underway
	0733-38					
	0740	Leach's Type	2	a		Rain
	0748	Leach's Type				
	0752	Leach's Type	1	o		
FF	0800	Leach's Type	1	e		
	0805	Sooty Tern	25±5			
	0811	Fairy Tern	4	o		Feeding.
	0850	Phalarope	1	N		Winter plumage
	0851	Leach's Type	1	e		
	0855	Phalarope	1	N		
SE	0855	Fairy Tern	9			
		Sooty Tern	8	♂		Searching
	0906-40			♀		adults
	1040	Leach's Type	1	e		Stgz.
FF	1100	Sooty Tern	26			
	1117	Red Phalarope	1	E		Some feeding
	1121	Leach's Sp	3	♂		winter plumage
	1121			♀		Bl line rear.
	1145-1315					Stop
	1337-1421					Breals. PT 5 MTS 3600
	1425					Underway
	1428	Fairy Tern	1			
	1430-40			o		Rain
F	1448 d 1500	Sooty Tern	15±2	o		Milling.
	1503	Sooty Tern	3			
	1525	Storm Pet	1	E		adults.
	1543			o		
	1548	Leach's Type	1			Stop
MF	1550	Sooty Tern		o		
	1625		9			
FF	1635	Sooty Tern	6	E		Milling.
	1700-10					Underway.
						Break.
FF	1723	Sooty Tern	12	e		some feeding.

FT - 14
Storm - 1
FT - 7
SI - 3
SI - 104
Fairy 2
Pet 1
153



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Woodward

Date 23 Feb 1967

Pg. # 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0633					Sunrise
0748					
0810	Leach's Type	1	o		Underway
0815	Leach's Type	1	o		
0828					1 Whale spouting
0830	Leach's SP	2	o		Bl line seen
0920	Leach's Type	1	o		
0929	Leach's Type	1	o		
0931-1016	Leach's Type	1	o		STOP.
1033					STOP
1145-1315					STOP
1500					BREAK
1523	Leach's SP	1	o		PT 5 KTS 007°
1524	Leach's Type	1	o		Bl line seen
1548	Red Phala	1	o		underway.
1555					
1610	Sooty Tern	1	o		adult.
1629	Leach's Type	1	o		
1649	Leach's Type	1	o		
1656	Leach's SP	3	o		Bl line seen
1700-1715					Break
1742					STOP
1751	Phalarope [illegible]	1	o		Underway
1755	Leach's SP.	3	o		[illegible]
1800	Leach's Type	2	o		Black line seen
1801					6±2 Cetaceans
1805	Leach's Type	2	o		
1810					6 Cetaceans in 8' dark gray - fairly stout dorsal fin angling posteriorly
1845					Green flash Sunset

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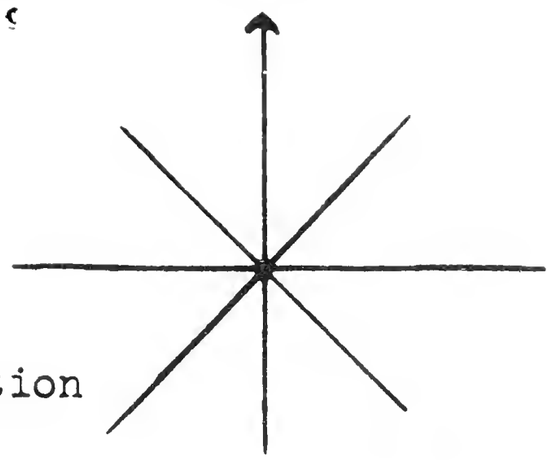
Rev. 5-66



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

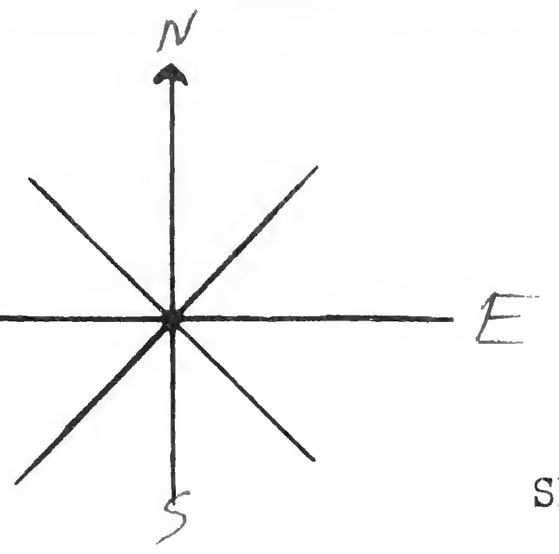
Date 22 Febr 1967
Pg.# 2

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
FF	1736	Sooty Tern	15 ± 2	Ca		feeding.
	1752	Leach's Type	1	o		
	1807					stop.
	1839	Leach's Type	1	O		
	1843					Sunset.

S7-15

S7-2

SI-MNH-958-e
Rev. 5-66



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 24 Feb 1967

Pg.# 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0635					Sunrise
0639					Stop.
0755	Unknown				Underway.
0814	WedgeTailSh	1	o		
0817	Leach'sType	1	o		dark phase.
0820	Leach'sType	1	o		
0825	SootyTern	1	o		
0825	Tahiti Pet	1	o		adult.
0904	WedgeTailSh	1	o		
0916	P. externa	1	o		Dark. Carrying an animal (squid?) in bill. Flying along - landing - putting food in H_2O Then flew off with animal still in bill. Repeated Several times. Wings elevated when the bird was in the H_2O.
0925	Phalarope	1	o		
0925	Leach'sType	1	o	on H_2O	
0928				Stop.	
0950				Underway.	
1036	Leach'sType	1	N		
1110	Leach'sType	1	o		
1117	RedPhala	1			on H_2O.
1122					Stop
1236-1330					Break.
1332-1414					
1340	Leach'sType	1	o		PT 54TS36"
1403	SootyTern	1	o		
F 1450	SootyTern	30±2	o		Sanding
1531-50					Stop
1558	Leach'sType	1	o		
1603	Leach'sType	1	N		
1605	Leach'sType	1	N		
1625					50-60 Spinning Porpoises.
1630	Leach'sType	1	o		
1633	JFPetrel	1	o		
1633	Wedgetail	1	o		Dark.
1635	Leach'sType	1	o		
1700	RedPhala	1			on H 20.
1710	P externa	1	o		
1720	Leach'sType	1	o		Appeared to be small billed - white under tail coverts - no white in wings.
1720	P. alba	1	o		

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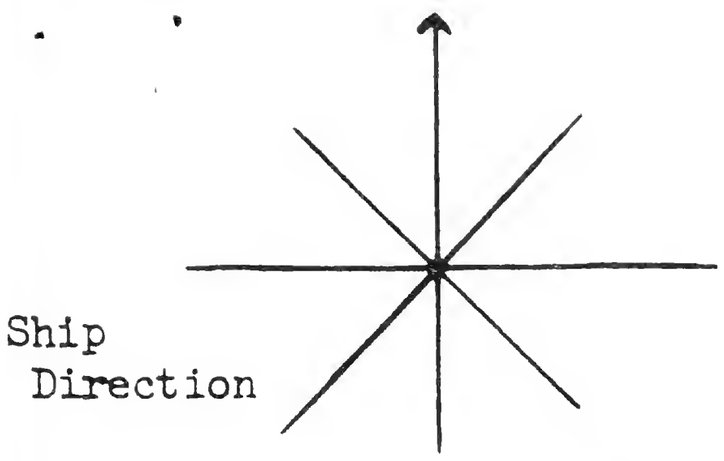
Rev. 5-66

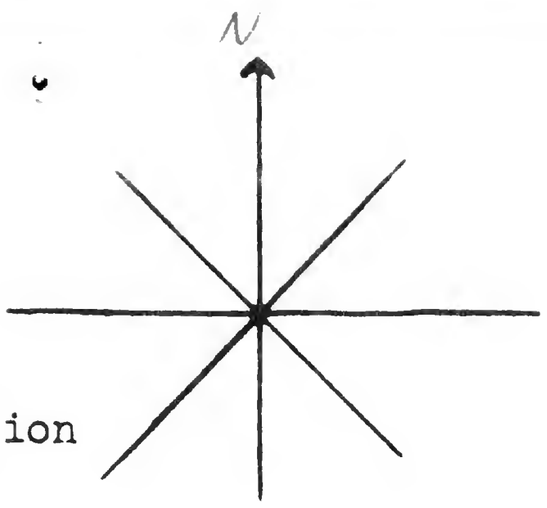


SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 24 Feb 1967
Pg.# 2

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	1724					STOP
F	1725	Tern Pet Sooty Tern Wedge tail	1 75±5 1	O		Intermediate phase. at least 6 immatures Adults
↓	1800	Leach's SP	25±2			light phase
	↓ 1835					feeding - Bl line seen.
						Underway Note on flocks - storm petrels
	1839					Sunset were feeding over a large (20yd2) brown mass (Euphausids) in the H_2O. Sooties were near by flying very low (<10') to H_2O in all the time I watched only 5 were seen high. Occasionally they would flutter to H_2O ~~not~~ prob picking up food. No active chasing No fish seen. Stayed in general area for 1 hour+. 5 Strangest flocks I have seen. Surface net haul was one of the largest for the trip. Once Termadec appeared to chase an immature ST



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 25 Feb 1967
Pg.# 1

	TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
	0640					Sunrise
	0647	Wedge Tails	1			
	0655	Sheam Pet	1			Daylight
	0704	J F Petrel	1			
	0705	J F Petrel	1			
	0724					
	0740	P. externa	1			Stop
	0850	P. externa	1			
	0851					
	0856	Tahiti ? Pet	1			Underway.
	0934	Sheam Pet	1			
	0936	Reach's Type	1			
TT	1005	Sooty Tern	7			
	1005	~~Dark~~ Pet	1			light
	1006	Sooty Tern	1			~~light~~ phase
	1019	Bird	1			subadult. just beginning to molt out of
	1019		1			Imm. plumage.
	1021					3 Eteericus
	1022	Reach's Type	1			Stop.
F	1040	Sooty Tern	25±5			
	1041					Distant prob feeding
	1052	Reach's Type	1			
	1052	Tahiti Pet	1			Underway.
	1053	Sheam Pet	1			
	1057	Reach's Type	1			9910 nmc - big brown bird
T-	1112	Sooty Tern	1			underwing - big bill - white under tail coverts.
	1127		15±5			light phase
	1145-	1245				Distant feeding.
	1300	P. externa	1			Stop.
	1400	Reach's Type	1			
1426	1432	P. externa	1			Break
	1500	J F Petrel	1			PT 5 KTS 360°
	1502	Reach's Type	1			
	1511					
	1523	Sheam Pet	1			Underway.
	1526	Reach's Type	1			

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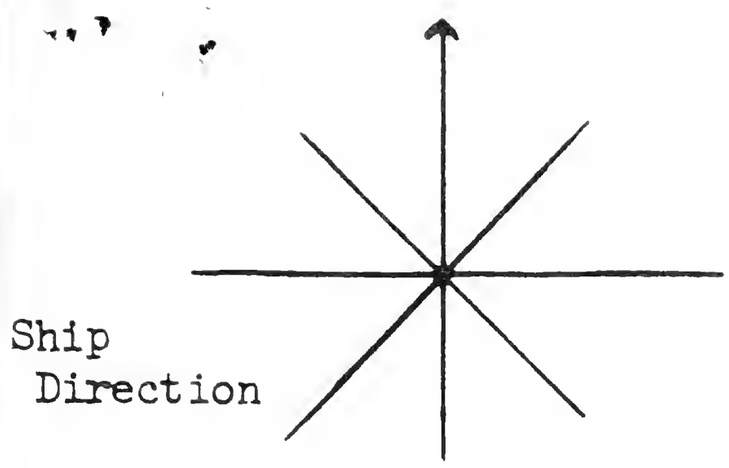
Rev. 5-66



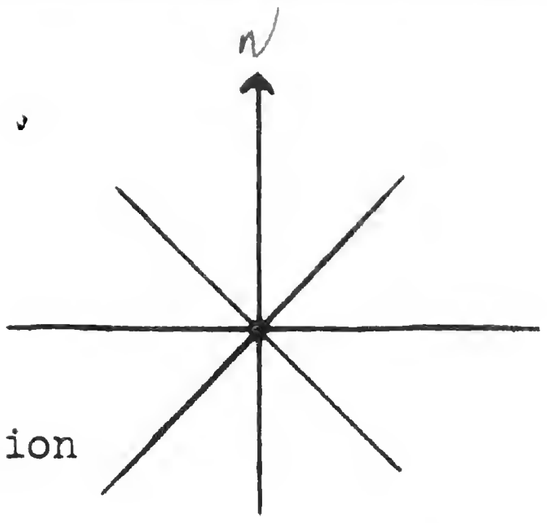
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 25 Feb 1967
Pg.# 1

	TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
P	1533	Sooty Tern	5			milling.
	1545	Leach's Type	1			
	1552	Leach's Sp	1			
	1614	Tahiti Pet	1			
F	1620	Sooty Tern	21			Bl line rear.
	1624	J F Petrel	1			Travelling adults at least two molting
	1621	Leach's Ty	1			
F	1644	Sooty Tern	26			
	1648	Leach's Type	1			> circling.
	1656	Sooty Tern	1			
	1720	J F Petrel	1			Subadult 2nd year
FF	1750	Sooty Tern	25±5			white belly + dark head forming hood.
		Tahiti Pet	3			feeding
	1755	DF Petrel	1			Distant
	1759	Tahiti Pet	1			
H	1800	Sooty Tern	15±5			
	1825	Leach's Type	1			feeding.
	1841					Sunset Stop.

ST - 63
LT - 4
DSP - 1
Tahiti - 2
DTP - 3
SP - 3
76



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

Date 26 Feb 1967
Pg.# 1

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	0642					Sunrise on station
	0715	Wedgetail	1	a		Intermediate phase
	0716	R-T Tropic	1	o		calling.
	0755					Underway.
	0822	P. Adelgae	1	~		
	0832	Red Phda	1	o		on H_2O
	0832	Leach's Type	1	o		
	0845	Leach's Type	1	o		
	0846-0915	56				
	0915	J F Petrel	1	o		ST & molting.
	0957	J F Petrel	1	o		
	1050	RT Tropic	1	o		
	1101	P. externa	1	o		
	1126					
	1145-1230					ST on Beacle.
	1300	Leach's Type	1			
	1325	Pom Jaeger	2			on H_2O
	1335	Tahiti? Pet	1	o		
	1355	J F Petrel.	1	o		on H_2O
	1418	RT Tropic	1	o		
	1426-1447					PT 360° 5 KTS
	1522	Fairy Tern	1	o		
	1523	Leach's Type	1	o		
SF	1530	J F Petrel	6			
		Sooty Tern	8	§		Searching.
		Shear. Pet	2	§		
	1531	Leach's Type	1	o		
F	1540	Pom Jaeger	1			IP chasing ST Searching
		Sooty Tern	12			
		Wedgetail	2			adults
	1545	Leach's Type	1	o		light phase
	1555	J F Petrel	1	o		
	1614	wedgetail	1	o		dark
	1615	J F Petrel	1	o		

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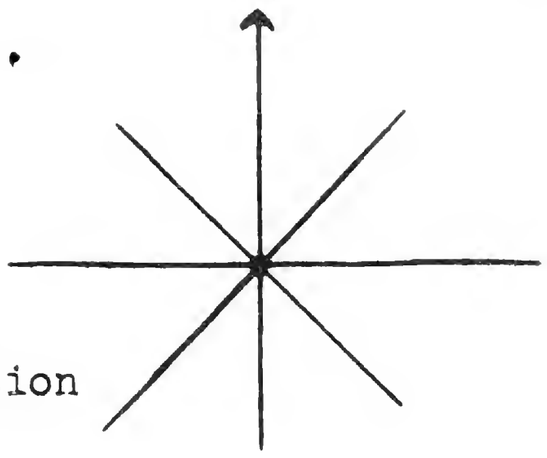


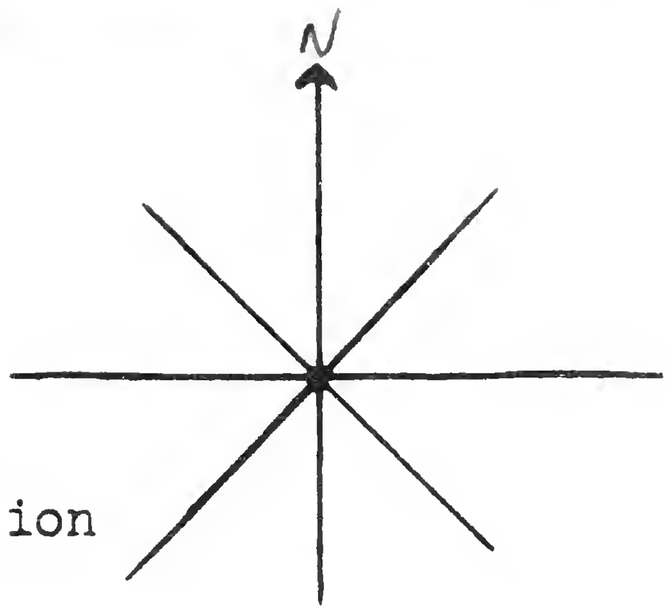
Ship Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 26 Feb 1967
Pg.# 2

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
SF	1620	J F Petrel	15±3	E		
		Sheaw Pet	3			Seaming.
		Sooty Tern	4			
	1631	Pom Jaeger	1	S		
	1645	P. externa	1	E		
SF	1658	Sooty Tern	29	NE		Seaming.
	1700	15				
FF	1717	Sooty Tern	40±5	E		Break.
	1735	Leach's sp	1	E		Some feeding - distant
	1740	P externa	3	E		OD line near.
F	1745	Sooty Tern	75	E		ad
	↓ 1755	Pom Jaeger	2	NE		Traveling
		Wedgetail	1			
	1755	Sheaw Pet	5			Light phase.
	1757	P. externa	1	E		Stop
	1810	RTTropic	2	E		one immature.
	1835					Sunset



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 27 Feb 1967
Pg. # 1

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	0639					Sunrise
	0655	J F Petrel	1	o		
	0702	Pterodroma	1	o		either Kermadec or Solander's not close enough for + I.D..
	0709	RT Tropic	1	o		
	0710	Leach's Type	1	o		Immature
	0725	Shear Pet	1	o		
	0729					Stop
	0759	jaeger	1	o		
FF	0826	Leach's SP	6	o		Feeding over slick - Dabbling feet in H_2O wings outstretched pecking [illegible] H_2O. Mod rough seas.
	~~08??~~	~~Leach's Type~~	~~1~~	o		
	0847					
0904						Underway.
	0920	Leach's Type	1	o		
	0921	Leach's Type	1	o		
	0928	Leach's type	1	o		
	0936	J F Petrel	1	o		
	0950	Leach's Type	1	o		
	1000	Wedge Tail	1	W		Light phase
	1005	Leach's Type	1	o		
	1006	Leach's Type	1	o		
	1007	Leach's Type	1	o		
S?	1043	Sooty Tern	10±2	o		Searching
	1045	Kerm Pet	1	o		
	1053	Bl Fa Booby	1	o		Light
	1100	Leach's Type	1	[illegible]		1st year bird. following ship still present 1330.
	1115	J F Petrel	1	o		
FF	1117	Leach's Type	6	o		
	1124					feeding.
	1132	Leach's Type				2 Sperm Whale spouting.
	1127	Leach's Type	1	[illegible]		
	1138	Leach's Type	1	—		
	1140		1	o		
	1200-1315					Stop.
	1335	Leach's Type	1	o		Break
	1400	Leach's Type	1	o		on H_2O
1426	1436	Shear Pet	1	o		PT 5KTS
	1458	Leach's Type	1	o		

BF B-1
Kerm-1
ST 10
JFP-3
Ptero-1
RTTB-1
Leach's type-21
Leach's 6
jaeger-1
S-P-2
W.T.S.-1
29 right?

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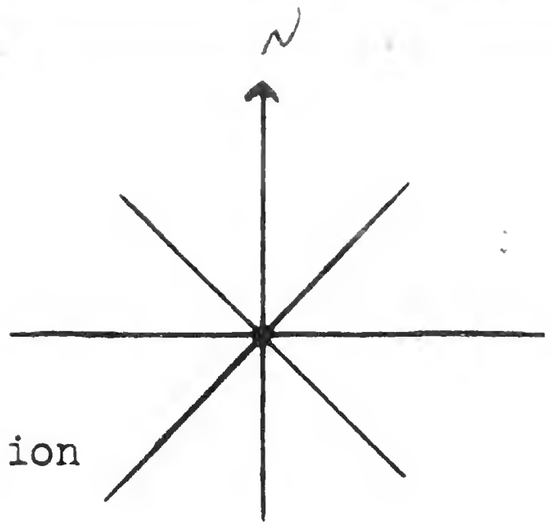

Ship Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 27 Feb 1967
Pg.# 2

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	1505	Leach's Type	1	O		
	1507	Leach's Type	1	O		
	1510					Underway
	1516	Leach's SP	2	O		
	1523	Leach's Type	1			Bleache line near.
	1525	Leach's Type	1	O		
	1544	Leach's Type	2	O		
	1546	Leach's Type	1	O		
	1548	Leach's Type	2	O		
	1600	Leach's Type	1	O		
	1603	Leach's Type	1	O		
	1605	Sooty Tern	1	E		
	1634	Leach's Type	3	O		
		Leach's Type	1	O		
	1647	Sheam-Pet	1	O		
F	1658	Fairy Tern	1			
		Sooty Tern	15±2	W E		Searching
	1700-10	Wedgetail	1			1 imm - 2 subadults not?
	1713	RT Tropic	1	O		dark.
	1714	Wedgetail	1			Breach.
	1715	Wedgetail	1	N E		Light
	1715	Leach's Type	3	N O		Light
	1725	Leach's Type	1	O		
	1735	Sheam Pet	1	W		
	1735	Leach's Type	1	O		dark
	1741	Leach Type	1	O		
	1744	Leach's Type	2	O		
	1745	Leach's Type	1	O		
	1755	Leach's Type	2	O		
	1807					4± Whales S W
	1808	Leach's Type	1	O		6-8' long - Black - small rounded angled
	1811	Leach's Type	2	O		part dorsal fin blunt snout.
	1821					
	1824	Wedgetail	1	W		Stop.
	1825	Wedge Tail	1	W		
	1826	Wedgetail	1	W		Light phase
Δ	1827	Leach's Type	6	W O		
	1833					Feeding over slick ship (garbage)
						Sunset

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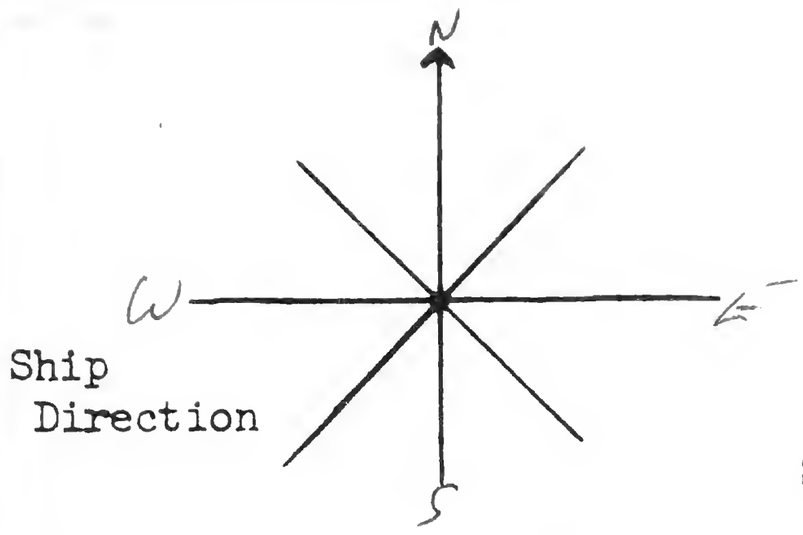
Rev. 5-66



Ship Direction

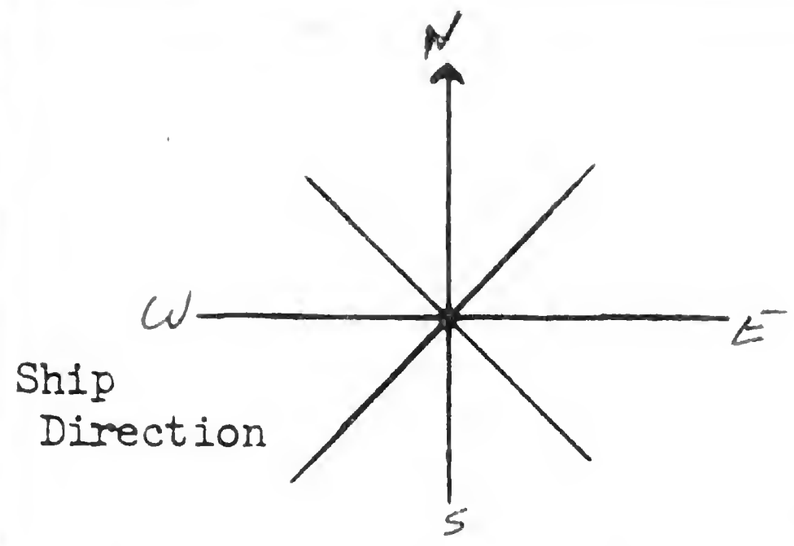
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS: Woodward

Date 28 Feb 1967
Pg.# 1

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	0640					On station Sunrise
	0651	Leach's Type	1	e		
	0653	DF Petrel	1	e		
	0654	Shear-Pet	1	e		
	0705	Shear-Pet	1	e		
	0706	Leach's Type	2	e		
	0738					Underway
	0820	Fairy Tern	1	e		
	0826	RT Tropic	1	e		
	0834	Wedgetail	1	(e)		Light
	0840	Shear Pet	1	(e)		
	0843	Leach's Type	1	e		
	0910	Sooty Tern	2	e		
	0926	Term. Pet	1	e		Dolphins
	0927	Leach's Type	1			
TF	0938	Sooty Tern	23	2W		150-200' High
	1030	Leach's Type	1	e		
	1059					Stop
	1145-1245					Break.
	1440 1500	RT Tropicbird	1			H_2O
	1508 1546	Leach's Type	1	e		PT SKTS
	1608	Bird				Underway
	1634	Leach's Type	1	e		
	1648	Leach's Type	1	e		
	1700-1702	10-47				BREAK
	1755	DF Petrel.	1	e		Stop
	1832					Sunset.

leach's type - 9
DFP - 2
S-P - 3
T - 1
RTB - 2
[illegible] - 1
F - 25
[illegible] 1
Bird 1
45



Ship Direction

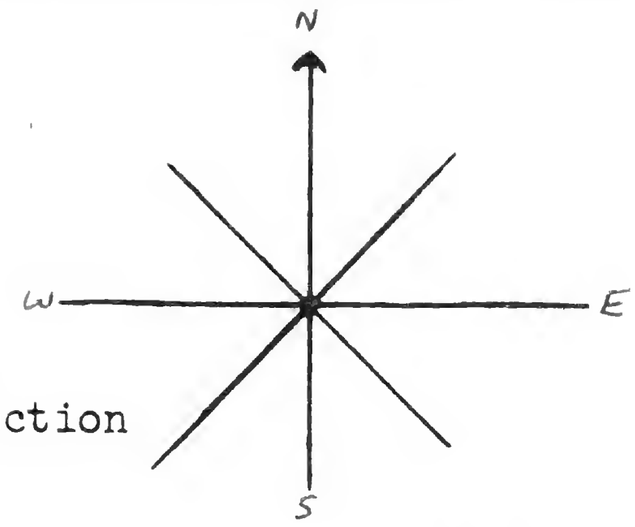
OBSERVERS:
Woodward

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 1 March 1967
Pg.# 1

	TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	0642					Sunrise
	0707	Leach's Type	1	a		
	0735	Leach's SP	2	a		Bl line seen.
	0747					
	0910					Stop
	0940					Underway
SF	1015	Leach's Type	1	a		
	1030	Sooty Tern	5	a		Ads searching.
	1140	Leach's Type	2	a		
	1145					Stop
	1230					Break
	1355	Leach's Type	1	a		
	1404					PT 360° 5 hrs
	1450					Underway.
	1535	Leach's Type	2	a		
	1642	Leach's Type	1	a		
	1651	Shear. PeT	1	a		
	1700					Breaks
	1800					Stop
	1825	Leach's SP	1	a		
	1831					Bl line seen
						Sunset.

Leach SP-3
Type 8
ST - 5
S-P-1
17



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 2 March 1967
Pg.# 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0643					Sunrise On station.
07[illegible]					
0750	Leach's Type	1	O		Underway
0756	Leach's Type	1	O		
0801	Leach's Type	1	O		
0809	Leach's Type	1	O		
0831	Leach's Type	1	O		
0832	Leach's Type	1	O		
0848	Leach's Type	1	O		
0848	Leach's Type	2	O		over slick.
0855	Leach's SP	1	O		Be line reon.
0905	Leach's Type	1	O		
0910	Leach's Type	1	O		12±5 Porpoises
0918	Leach's Type	1	O		
0928	Leach's Type	1	O		
0936	Leach's Type	3	O		
0936	Leach's Type	1	O		
0945	Leach's Type	2	O		
0945	Leach's Type	1			a H20
0950	Leach's Type	1	O		
1001	Leach's Type	2	O		
1001	Leach's Type	1	O		
1015	Leach's Type	1	O		feeding
1030	Leach's Type	1	O		
1056	Leach's Type	1	O		
1100-1200					Stop
					BREAK
1300	Leach's Type	1	O		
1335-1[illegible]					
1429	Leach's Type	1	O		
1455	Leach's Type	2	O		
1624					Stop
1650	Leach's SP	1	O		
FF 1807	Leach's Type	7			feeding
1829					feeding over slick.
					Sunset

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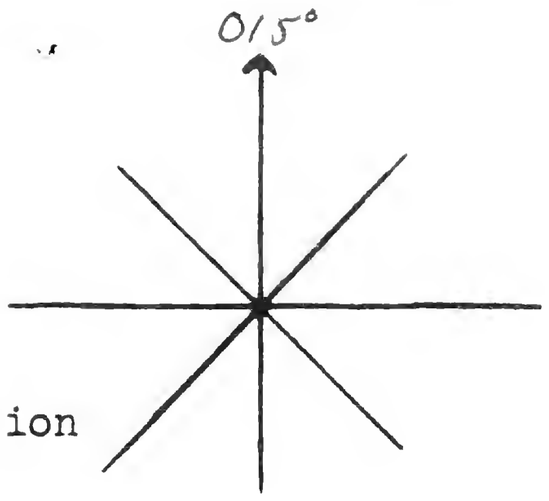


Ship Direction

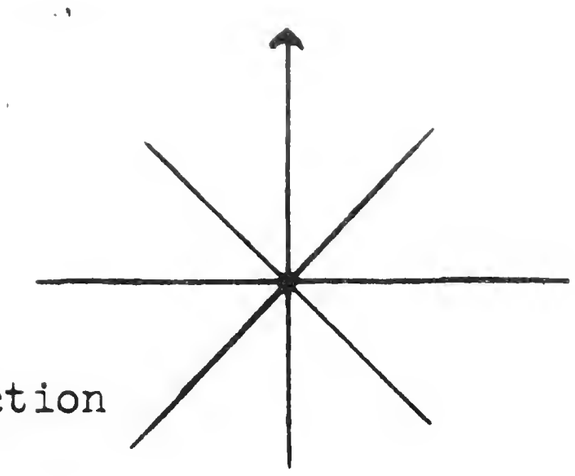
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 3 March 1967
Pg.# 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0637					Sunrise
0645					
0730	Leach's Type	1	a		Underway.
0738	Leach's Type	1	a		
0740	Leach's Type	1	a		
0743	Leach's Type	1	a		
0757	Leach's Type	1	a		
0800					Stop
0808	Leach's Type	1	a		
0815	P. puffinus	1	a		
0815	~~Band~~ Leach's Type	1	a		
0816					Underway.
0820	Leach's Type	1	a		
0826	Leach's Type	1	a		
0833	Leach's Type	1	a		
0843	Leach's Type	1	a		
0846	Leach's Type	1	a		
0858	Shear-Pt	1	a		
0905	P. puffinus	1	a		
0905	Leach's SP	1	a		BS line seen.
0910	Leach's Type	2	a		
0915	Leach's Type	2	a		
0928	Leach's Type	1	a		
0928	Leach's Type	1	a		
0935	Leach's Type	1	a		
0936	Leach's Type	1	a		
0946	100a				Stop
1010	Leach's Type	1	a		
1020	Leach's Type	1	a		
1026	Leach's Type	1	a		
1040	Leach's Type	1	a		
1111					Cleared ~~rotken~~ surface thermocline (temp ~~—~~ curve)
1400					Stop x Break
1500	Leach's SP	1	a		Resume Watch.
1505					Black line seen
1510	Leach's Type	1	a		Underway - Heading 60°
1510	Leach's Type	1	a		
1700-1744	15 Shear-Pet	1	a		Break.

RT 25
SP - 2
PP - 2
Leach 2
31



Ship
Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 3 March 1967
Pg.# 2

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1805	Laridae sp	1	0		
1822					Sunset

LT-1

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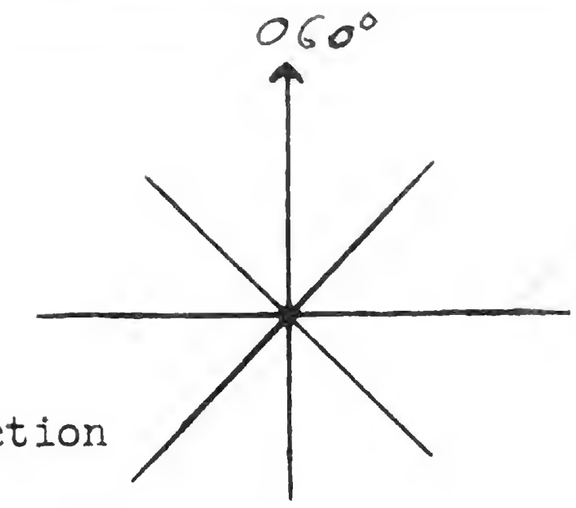
Rev. 5-66



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

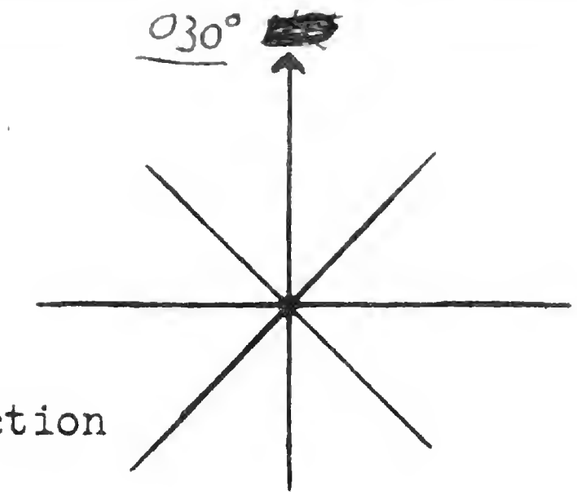
OBSERVERS:

Date 4 March 1967
Pg.# 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0633					Sunrise
0700					Breakfast for STa
1045					Lunch - Underway
1120	P. cookii	2	a		
1330	Leach's Type	1	a		
1336	Phalarope	1	W		
1350					
1405	P. Cookii	1	a		Y0-50 Stenella making W Movement Taken.
1440	P. cookii	1	W		Some flapping and gliding Shape similar To Puffinus
1502	Leach's Type	1	a		X-section Profile Distant flight Banking seepict.
1518	Leach's Type	1	a		
1536					Y5±10 Stenella
1632	P cookii	1	E		
1635	P cookii	1	E		
1650	Leach's Type	1	a		
1651	Pterodroma	1	E		
1652					STop
1655	Leach's Type	1	a		
1809					Sunset.

Photo-1
Cook's 6
Type-5
Photo 1
15

SI-MNH-958-e
Rev. 5-66



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

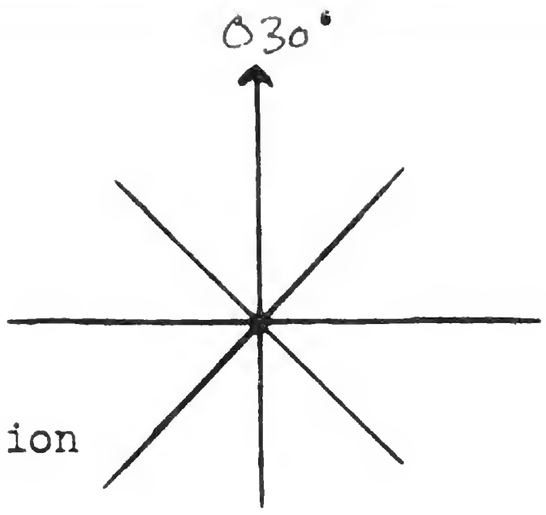
Date 5 March 1967
Pg.# 1

	TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
	0622					26-35 124-40
	0700					Begin Observations
	0820	Leach's T.	1	o		
	0856	P. wolfi	1	o		
	~~1000~~					
	0900–1200					Cape Br
	1213	Leach's Type	2	o		
TF	1220	Red Phal	10	WNW		
	1245	Leach's Type	1	o		Traveling
	1248	Sooty? Shear	1	N		
	1249	Leach's Type	1	o		
	1318	Phalarope	1	NW		
	1344	Leach's Type	1	o		
	1348	Leach's Type	1	o		
	1400–1520					
	1525	Phalarope	1	NW		Break.
	~~1526~~					
	1555	Phalarope	1	NW		
	1626	Phalarope	1	NW		
	1628	Phalarope	1	NW		
	1715–30					Break
	1740	Leach's Type	1	o		
	1745	Laysan Albatross	1	o		
	1755	Leach's Type	1	o		
	1800					28-55 119-25

12- 27-41 120 06

Type 9
LA 1
Cook 1
RPhal 10
SS 1
Phal-5
27

SI-MNH-958-e
Rev. 5-66



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 6 March 1967
Pg.# 1

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0615					Sunrise
0625	Her. Gull	2			following SAS
0627	BF Alba	1			"
0627	Her Gull	2			Following Total 4
0640	BF Alba	1			Total 2
0658	Her Gull	4			Total 8 - 7 SA - 1 adult
0746	Calif Gull	1			adult following
0800					
0815 0830-55	Her Gull	2			15±5 Porpoise
0905	Ring-bill Gull	1			5 Type 2 adult only 8 present 3rd year
0922	Bl-legKit	1			Imm not following
0925	Her Gull	3			subadult
1000	Calif Gull	1			Immature
1015	West Gull	1			3rd year
1030	Calif Gull	1			adult Total 3
1045-1145					Break
1150	West Gull	1			adult no Black foot
1225	West Gull	8			adult
1255					Porpoises 15±5
1300	Br. Pelican	1	a		
1300					Ceare Observations - next to Las Coronados Islas

Gulls following ship.

Her — 13
Br Pel - 1
BFA 2
Cal - 3
Ring - 1
Kit - 1
West 10
31 (?)

Species Identification (29-34)

Bird	100000
Non-sea birds	199999
Whale/Porpoise sp.	070000
Albatross sp.	121000
Arctic Tern	146835
Black-foot Albatross	121110
Black-winged/ Bonin I. Petrel	122629
Blue-faced Booby	133206
Blue-grey Noddy	146201
Bristle-thighed Curlew	142101
Brown Booby	133217
Bulwer's Petrel	122701
Christmas I. Sh.	122521
Common Noddy Tern/ Noddy Tern	146101
Dark-rumped petr.	122606
Fairy Tern/ White Tern	146301
Fork-tailed petr.	123423
Golden Plover	141209
Great Frigatebd.	136107
Grey-backed tern	146866
Gull sp.	145100
Hawaiian Noddy Tern	146110
Harcourt's Storm Petrel	123404
Herald's Petrel	122642
Jaeger sp.	144100
Juan Fernandez p.	122608
Kermadec Petrel	122633
Laysan Albatross	121111
Leach's storm Pet.	123409
Lesser Frigatebd.	136114
Long-tailed Jaeg.	144103
Mottled Petrel	122624
Manx Shearw.	122522
New Zealand Sh.	122518
Noddy sp.	146100
Northern Fulmar	122101
Pale-footed Sh.	122501
Petrel sp.	122600
Phalarope sp.	143000
Phoenix I. Pet.	122636
Pink-footed sh.	122504
Pomarine Jaeger	144101
Pterodroma externa	122601
Pterodroma sp.	122600
Red-footed Boody	133213
Red-tailed tropic-bird	131106
Red Phalarope	143101
Ruddy Turnstone	141401
Sanderling	142700
Shearwater	122500
Shearwater/Petrel	122000
Shorebird	141000
Skua	144201
Slender-bill Sh.	122520
Sooty Shearwater	122519
Sooty Tern	146867
Storm Petrel sp.	123000
Tahiti Petrel	122620
Tern sp.	146000
Tropicbird sp.	131100
Wandering Tattler	142201
Wedge-tailed Sh.	122510
White-necked Petrel	122609
White-tailed Tropic-bird	131112
White-winged Petrel	122649
Wilson's Storm Petr.	123103
White-throated Storm Petrel	123502
White-Rumped Storm Petrel	123409
White-throated Storm Petrel	123502
Gull sp.	145000
Calif. Gull	145151
Common Gull	145146
Glaucous Gull	145185
Glaucous-winged Gull	145184
Herring Gull	145152
Ring-billed Gull	145145
Western Gull	145178
Black-legged Kitti-wake	145110

Association (35)

0,6,7,8,9 Not Assoc.
1,2,3,4,5 Assoc.

Arctic Tern
Royal Tern
Brown-winged Tern
Sooty Tern
White Tern
Common Tern
Black Noddy
Gull-billed Tern
Brown Noddy
(Least) Tern
Fairy Tern
Black Tern
Common Tern
Cassin's Auklet
Xantus Murrelet

Green Heron
Cattle Egret
Kaltern
Common Hawk
Whimbrel
Willet
Lesser Yellowlegs
Spotted Sandpiper
Ruddy Turnstone
Night Heron
Black-winged Dove
Emperor
Mynah
Barn Swallow
Cliff Swallow
Prothonotary Warbler
Red-winged Blackbird
Mourning Dove
Barn Owl
Short-eared Owl
Hermit Thrush

EASTROPAC

Arctic Loon

✓Waved Albatross
• Black-footed Albatross
✓Laysan Albatross
Procellaria
• Black-vented Shearwater — NZ Shearwater
• Towsend Shearwater
• Wedge-tailed Shearwater
Pink-footed Shearwater
Sooty Shearwater
• Slender-billed Shearwater
Manx Shearwater
• Pale-footed Shearwater
Christmas Shearwater
Audubon Shearwater

• Juan Fernandez Petrel includ P. externa

• Tahiti Petrel
Giant Petrel
• Kermadec Petrel
Murphy's Petrel
Herald Petrel
• Phoenix Petrel
Cook's Petrel
• White-winged Petrel
• Dark-rumped Petrel
• Black-winged Petrel
Cape Petrel
Bulwer Petrel

Graceful SP
White-bellied SP
• Leach's SP
• White-throated SP X
• Galapagos SP
• Harcourt SP
Ashy Pet
Least Pet
• Markham Petrel
• Black Petrel
• White-faced Petrel X
Fork-tailed SP?

Wilson's SP

- Red-billed Tropicbird
- Red-tailed Tropicbird -
  White-Tailed Tropicbird

- Blue-faced Booby
- Red-footed Booby
  Blue-footed Booby
- Brown Booby

- Great Frigatebird
- Magnificent Frigatebird

Brown Pelican

Brandt (cormorant
Cormorant sp.

B-W Cinnamon Teal
Surf Scoter
Mallard
Pintail

- Red Phalarope + Pl.
- Northern Phalarope

Shma
- Pom Jaeger

Long-Tailed Jaeger
Parasitic Jaeger → Laughing Gull
Swallow-Tailed Gull
Sabine's Gull
Western Gull
California Gull
Herring Gull
Ring-billed Gull
Bonaparte's Gull
Heermann's Gull
Bl-legged Kittiwake